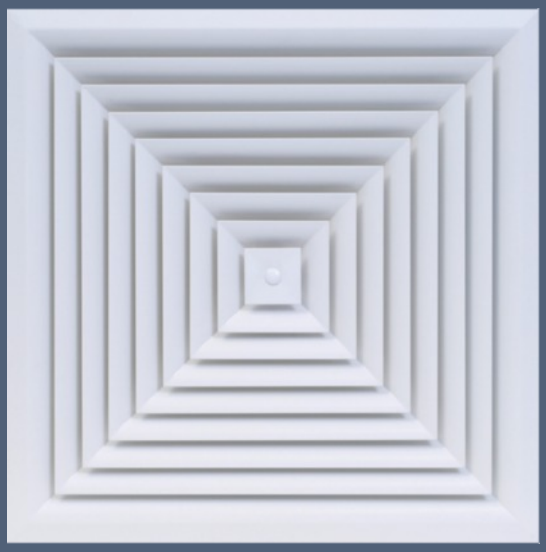
TPM 003/97
Revision 3
Valid from 1/7/19

MANDÍK®

ANEMOSTAT DIFFUSER SQUARE - TYPE

ALCM



These technical conditions state a row of the manufactured sizes and models of ceiling-,lamella- and square-type anemostat diffuser (further only anemostat) ALCM 250,300.400,500,600,625. It is valid for a production, designing, ordering, delivery, assembly and operation.

I. CONTENT

II. GENERAL

1. Description

1.1. Anemostats are the end exhausting element for the distribution of the air. They are used in the rooms of height approx. 2,6 − 4 m and they are suitable for the supply and outlet of the air.

Anemometers have the face outlet areas from the fixed sectional lamellas /plates/ arranged horizontally and they are produced in the following sizes 250, 300, 400, 500, 600 in five models of the face plates.

They are supplied in a work−manship for the horizontal connection via the connecting box, for the vertical connection on a square piping with the regulation (without connecting box) and in a compact workmanship with the regulation R1.

1.2. Anemostats are intended for environment protected against weather impacts with the classification of climatic conditions class 3K5, without condensation, frost, ice formation, and without water even from other sources than rain according to EN 60 72133, change A2.

Air flow must have a temperature between -20 to +70 °C.

Anemostats are suitable for systems without abrasive, chemical and adhesive particles.

1.3. If is not noticed other way, all dimensions and weight are in millimeters and kilograms.

2. Design

2.1. Anemostats are supplied in five models of the face plate by the sizes 250, 300, 400, 500, 600 − basic I, H, L, U, by the size 625 in one model − basic model of the face plate.

Connection to the piping is possible as follows:

- Connection to the ductwork: - to the UNIBOX for horizontal connection with round collar (in collar can be placed regulating flap, front plates can be installed and removed with the central assembly screw). Detailed description of Unibox is mentioned in technical data sheet TPM 139/19
- without connection box vertically to rectangular ductwork (anemostat is always equipped with regulating flap in extension piece).

Fig. 1 ALCM with connection box - horizontal connections

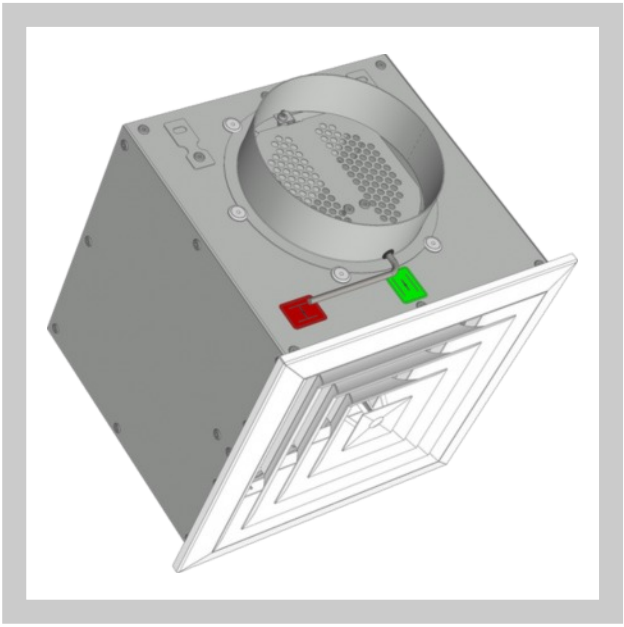
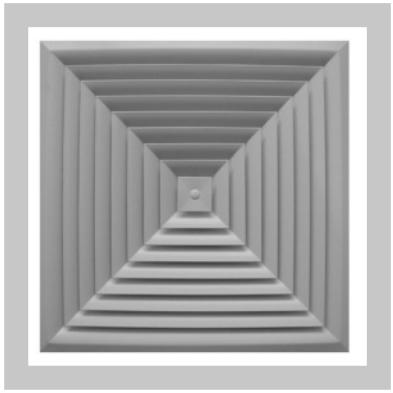


Fig. 2 ALCM connection box - vertical connections

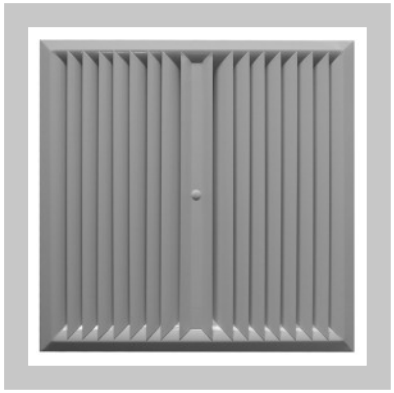
2.2. Face plates

Basic model

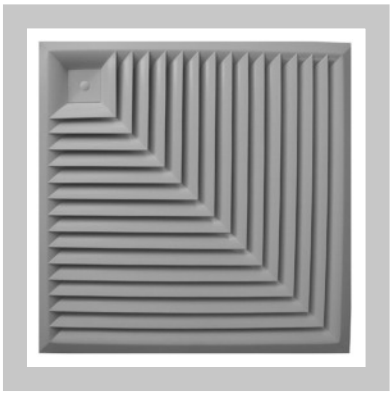


I Model

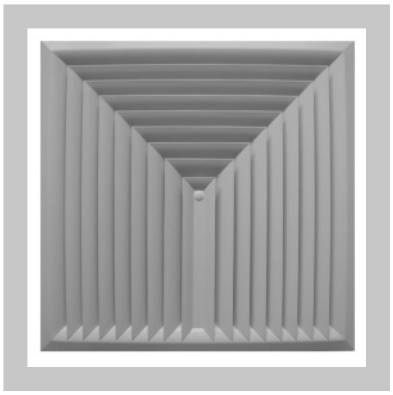
H Model



L Model



U Model



3. Dimensions and weights

3.1. Dimensions and weights of face plates + regulation

Tab. 3.1.1. Dimensions and weights of face plates + regulation

Size [mm]	□C	□B	□E	Vertical to square−type piping with regulation [kg]	Compact design with regulation R1 (including face plate) [kg]	Separate face plate [kg]
250	248	205	150	1,8	1,6	0,8
300	298	255	200	2,3	2,1	1,0
400	398	355	300	3,9	3,7	1,9
500	498	455	400	5,7	5,5	3,1
600	598	555	500	8,0	7,8	4,4
625	623	580	525	8,6	8,4	4,6

Fig. 3 Vertical connection to the square piping with a regulation

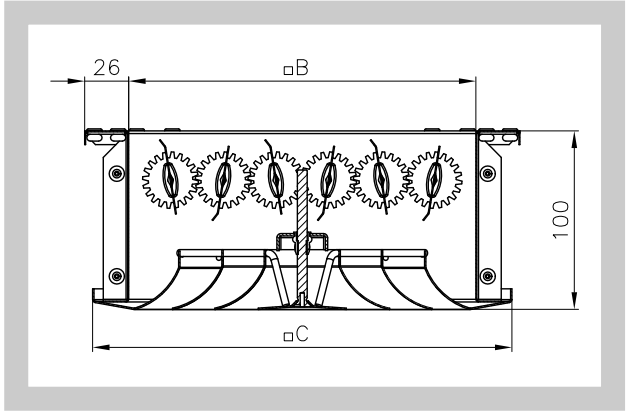
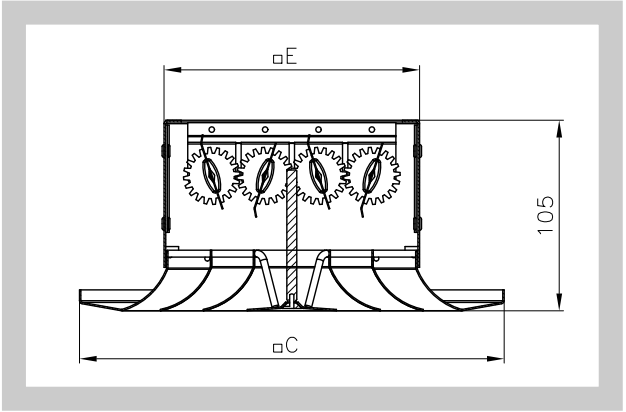
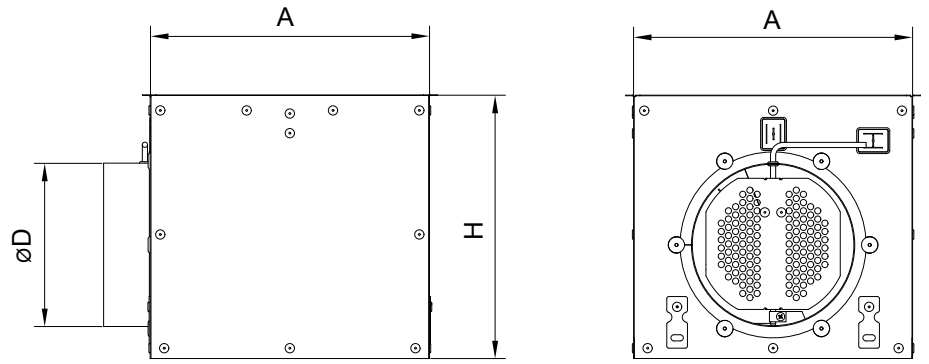


Fig. 4 Compact designs with regulation R1



3.2. Connecting box in design for horizontal connection and rectangular front plates.

Fig. 5 Horizontal connection, rectangular front plates



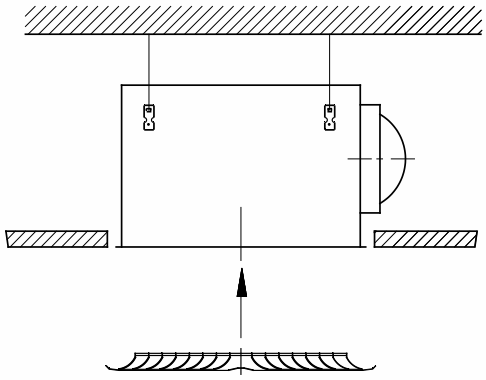
Tab. 3.2.1. Horizontal connection, rectangular front plates – dimensions, weights

Size [mm]	A [mm]	H [mm]	øD [mm]	Weights [kg]
250	220	255	158	1,8
300	270	255	158	2,3
400	370	295	198	3,5
500	470	295	198	4,8
600	572	345	248	6,7
625	600	345	248	7,1

4. Installation

4.1. All sizes are suitable for the built-in installation to the ceiling. Connection boxes are provided with suspension devices by means of central screw.

Fig. 6



All sizes are suitable for the building with the lower ceiling (soffit) and also for the location out of the closed ceilings.

Connecting boxes are provided with the suspension clamps. There is possible to attach and also disassemble the face plates by means of central bolt.

III. TECHNICAL DATA

5. Basic parameters

5.1. Basic parameters

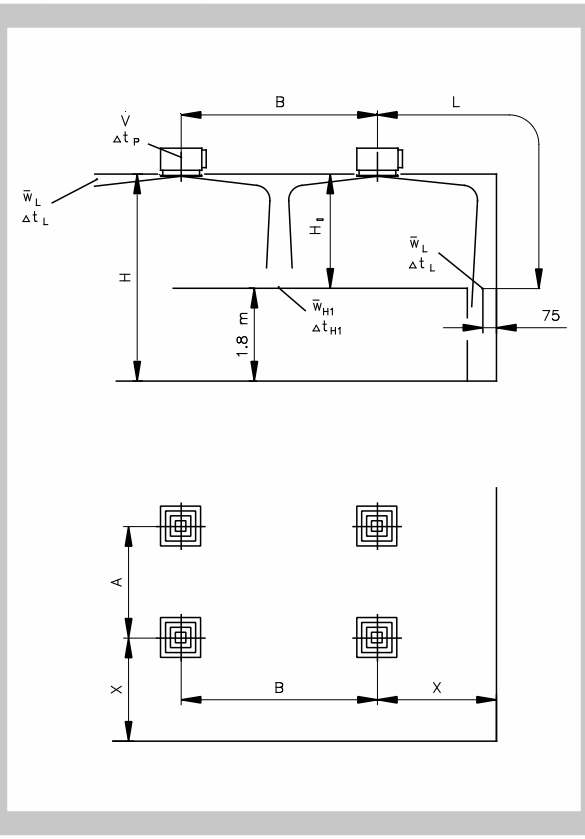
Tab. 5.1.1. Basic parameters

Size	250	300	400	500	600	625
$\dot{V}_{max}$ [m³.h⁻¹]	220	310	530	850	1200	1600
$\dot{V}_{min}$ [m³.h⁻¹]	70	100	180	300	470	490
L_{WAmax} [dB(A)]	43	43	42	42	42	42
L_{WAmin} [dB(A)]	<15	<15	<15	<15	<15	<15

Tab. 5.1.2. Effective surface of the anemometer [m²]

Size	Face plate model				
	Basic	I	H	L	U
250	0,0178	0,0083	0,0108	0,0108	0,0123
300	0,0282	0,0154	0,0192	0,0195	0,0204
400	0,0554	0,0363	0,0504	0,0435	0,0426
500	0,0915	0,0660	0,0864	0,0762	0,0728
600	0,1364	0,1045	0,1320	0,1178	0,1110
625	0,1366	-	-	-	-

Fig. 7 Determining variables



$\dot{V}$	[m³.h⁻¹]	volume rate of flow of the air for one anemostat
A, B	[m]	distance between two anemostat
L	[m]	horizontal and vertical distance (X + H_1)
X	[m]	distance of the anemostat center from the wall
H	[m]	height from ceiling
H_1	[m]	distance between the ceiling and movement zone
$\bar{w}_L$	[m.s⁻¹]	medium speed of flow on the wall
$\bar{w}_{H1}$	[m.s⁻¹]	medium speed of flow between two anemometers in the distance H_1
w_{ef}	[m.s⁻¹]	output effective speed of the air
Δt_p	[K]	difference between the temperature of the supplied air and temperature of the air in the room
Δt_L	[K]	difference between the temperature of the flow in the distance L = A/2 + H_1 or L = B/2 + H_1 or L = X + H_1 and temperature of the air in the room
Δp_c	[Pa]	total pressure loss by ρ= 1,2 kg.m³
L_{WA}	[dB(A)]	level of the acoustical output
S_{ef}	[m²]	effective area of the anemostat

6. Aerodynamic data

6.1. Output effective velocity

Chart 6.1.1. **Output effective velocity - Basic model of the face plate**

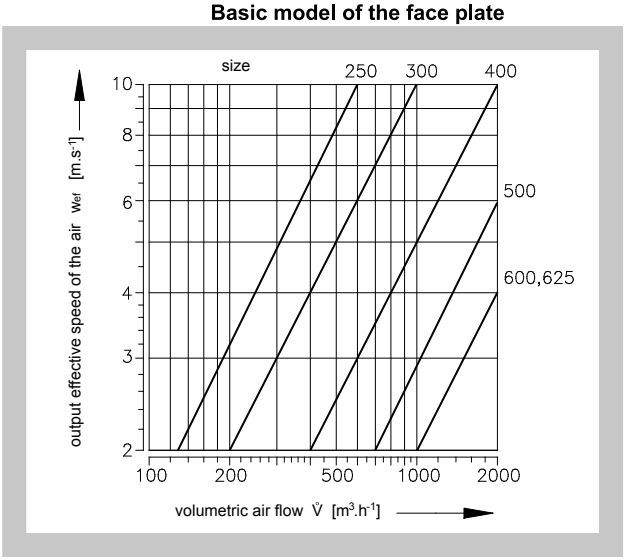
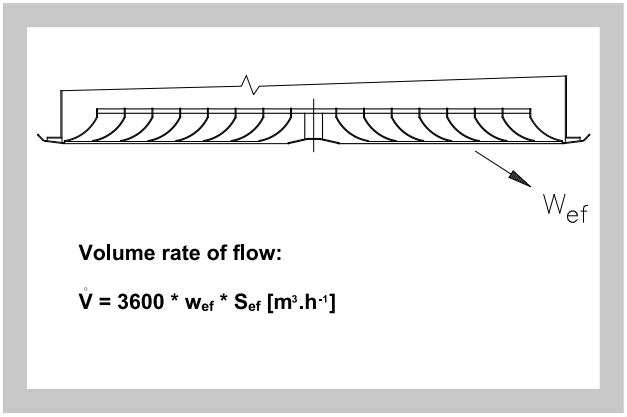


Fig. 8



Volume rate of flow:

$\dot{V} = 3600 * w_{ef} * S_{ef}$ [m^3.h^{-1}]

Chart 6.1.2. **Output effective velocity - I model of face plate**

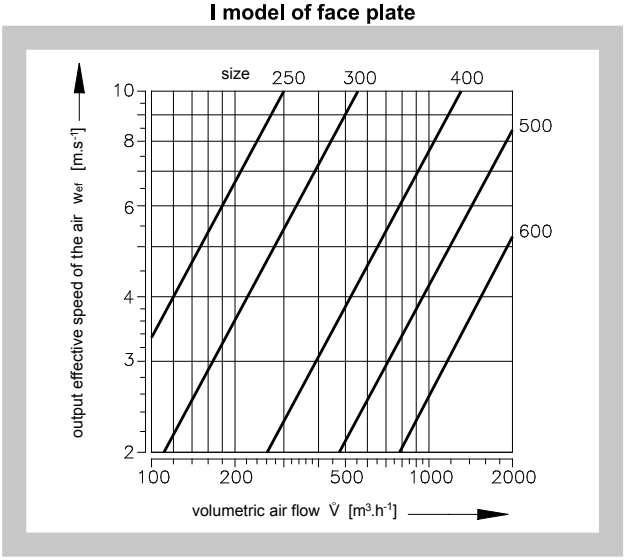


Chart 6.1.3. **Output effective velocity - H model of face plate**

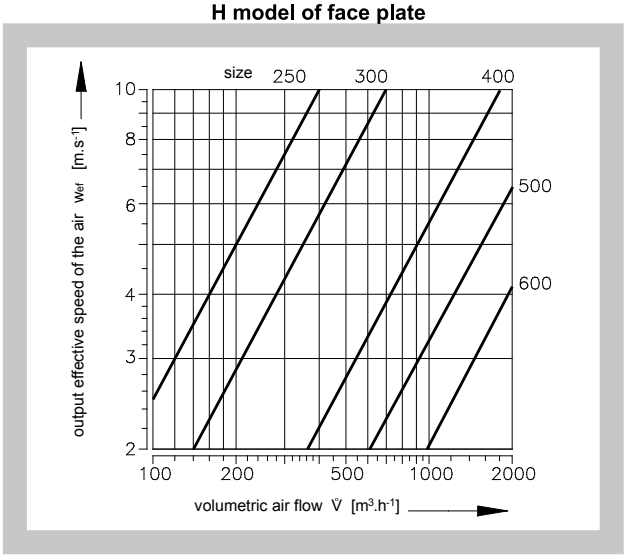


Chart 6.1.4. **Output effective velocity - L model of face plate**

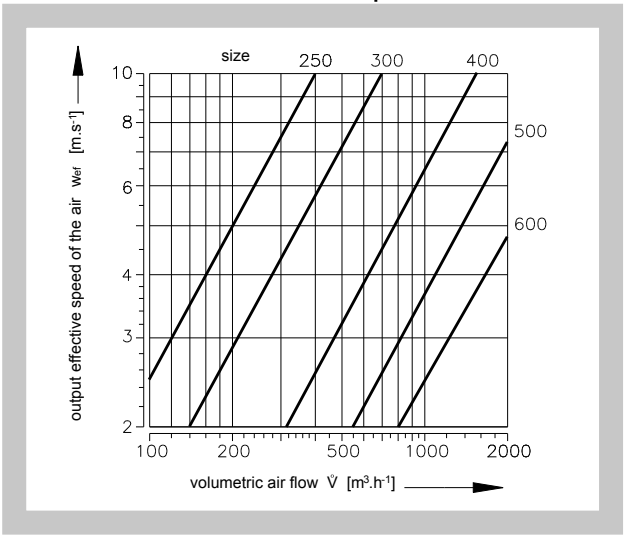
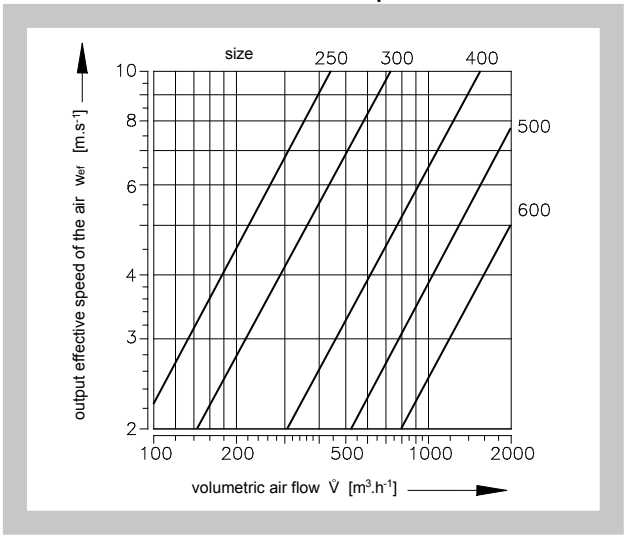
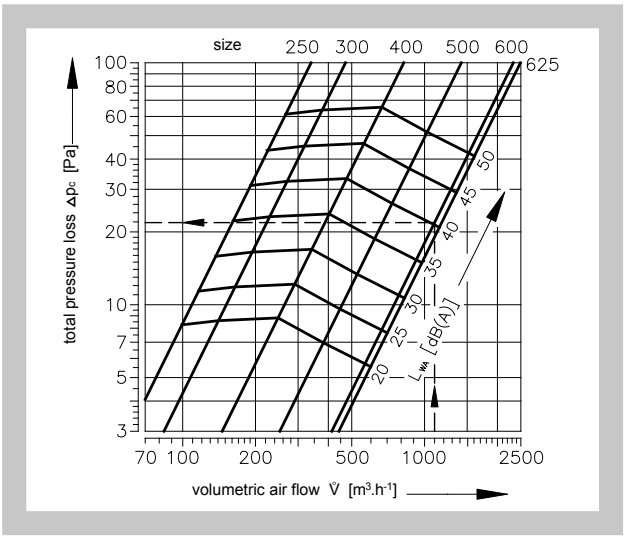


Chart 6.1.5. **Output effective velocity - U model of face plate**



6.2. Acoustical output and pressure losses

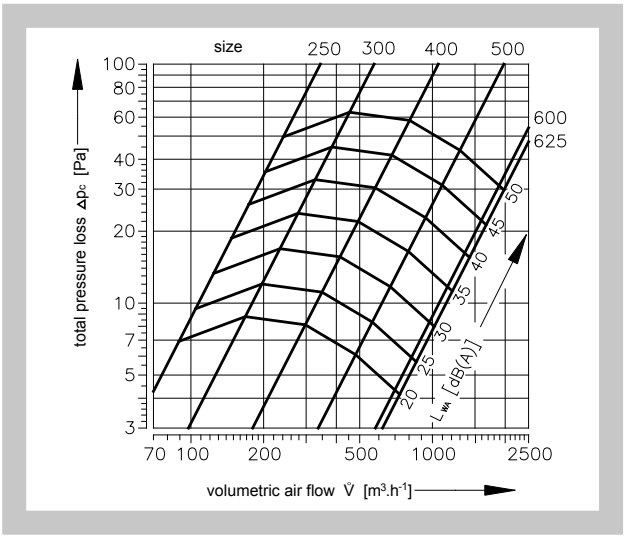
Chart 6.2.1. connection via connecting box – SUPPLY



Tab. 6.2.1. Correction to Chart 6.2.1. Adjustment of the adjusting flap

Size		Angle of flap adjustment		
		0°	45°	90°
250	Δ pc	x1,0	x1,1	x1,7
	LWA	-	1	1
300	Δpc	x1,0	x1,1	x2,6
	LWA	-	-	2
400	Δpc	x1,0	x1,2	x3,0
	LWA	-	1	3
500	Δpc	x1,0	x1,3	x3,4
	LWA	-	1	3
600	Δpc	x1,0	x1,2	x3,6
	LWA	-	2	4
625	Δpc	x1,0	x1,2	x3,6
	LWA	-3	-	1

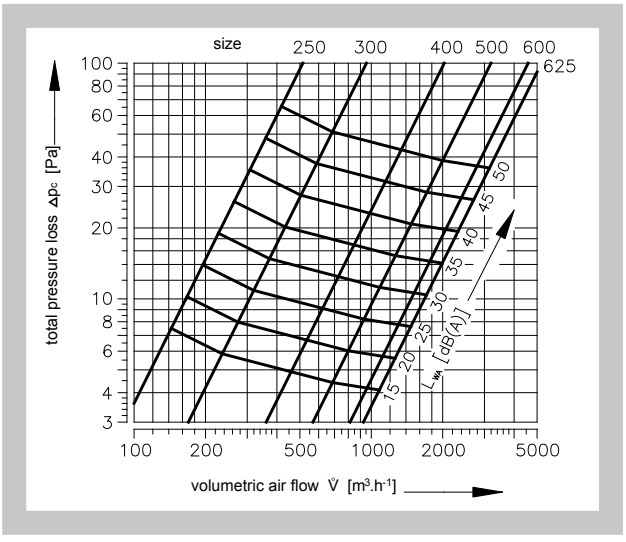
Chart 6.2.2. connection via connecting box – OUTLET



Tab. 6.2.2. Correction to Chart 6.2.2. Adjustment of the adjusting flap

Size		Angle of flap adjustment		
		0°	45°	90°
250	Δ pc	x1,0	x1,1	x1,7
	LWA	-	-	1
300	Δpc	x1,0	x1,2	x1,9
	LWA	-	2	4
400	Δpc	x1,0	x1,3	x2,6
	LWA	-	1	4
500	Δpc	x1,0	x1,5	x3,6
	LWA	-	1	6
600	Δpc	x1,0	x1,8	x4,1
	LWA	0	1	7
625	Δpc	x1,0	x1,9	x4,1
	LWA	-3	-1	4

Chart 6.2.3. connection vertical to square piping with regulation – SUPPLY



Tab. 6.2.3. Correction to Chart 6.2.3. Adjustment of the adjusting flap

Size		Angle of flap adjustment		
		0°	45°	90°
250	Δ pc	x1,0	x1,4	x4,1
	LWA	-	12	30
300	Δpc	x1,0	x1,9	x6,6
	LWA	-	15	34
400	Δpc	x1,0	x1,7	x8,1
	LWA	-	18	36
500	Δpc	x1,0	x1,9	x8,5
	LWA	-	21	40
600	Δpc	x1,0	x2,3	x8,9
	LWA	-	22	42
625	Δpc	x1,0	x2,4	x9,0
	LWA	0	23	43

6.3. Temperature coefficient

Chart 6.3.1. Temperature coefficient - basic model of face plate

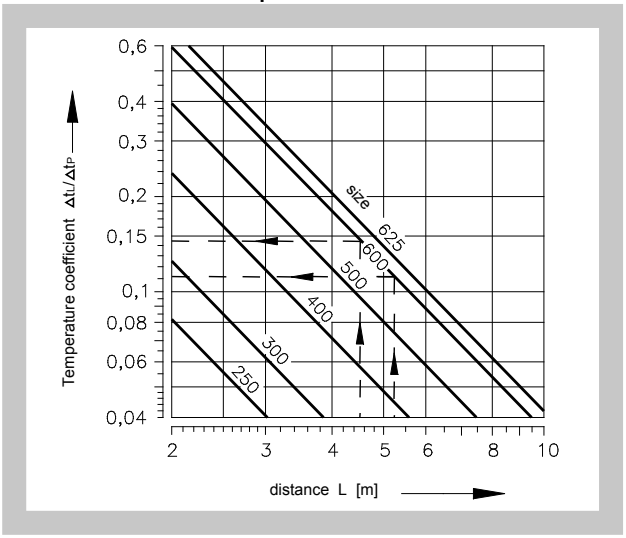


Chart 6.3.2. Temperature coefficient - I model of face plate

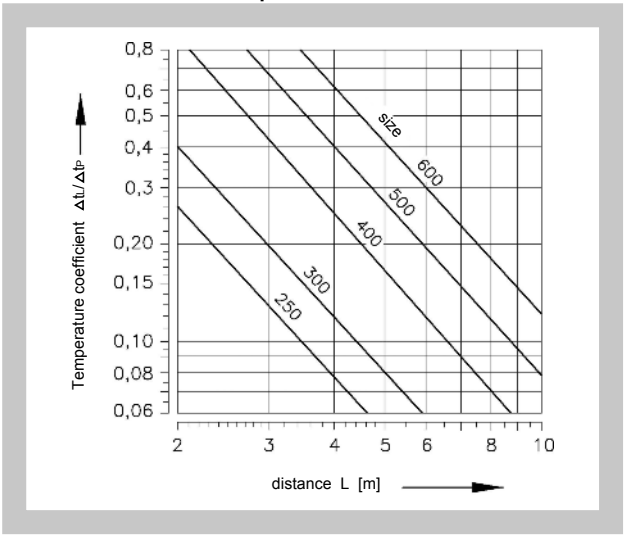


Chart 6.3.3. Temperature coefficient - H model of face plate

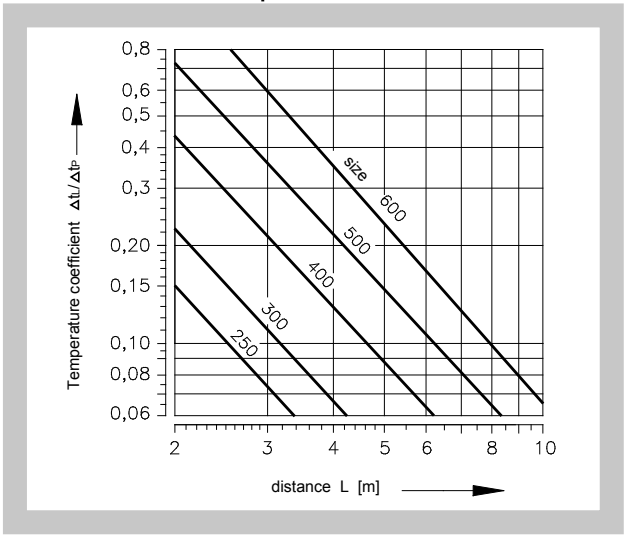


Chart 6.3.4. Temperature coefficient - L model of face plate

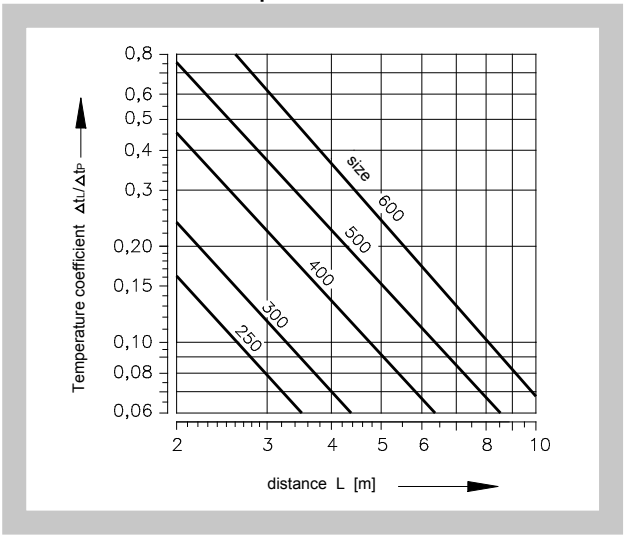
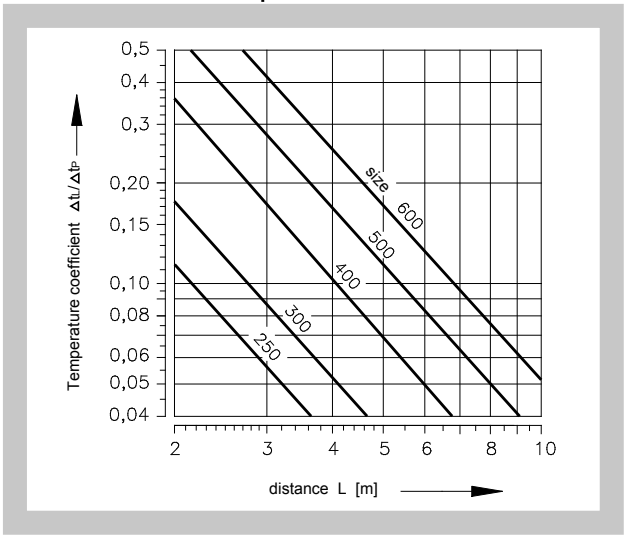


Chart 6.3.5. Temperature coefficient - U model of face plate



6.4. Velocity of airflow

Chart 6.4.1. Velocity of airflow - size 250, basic model of face plate

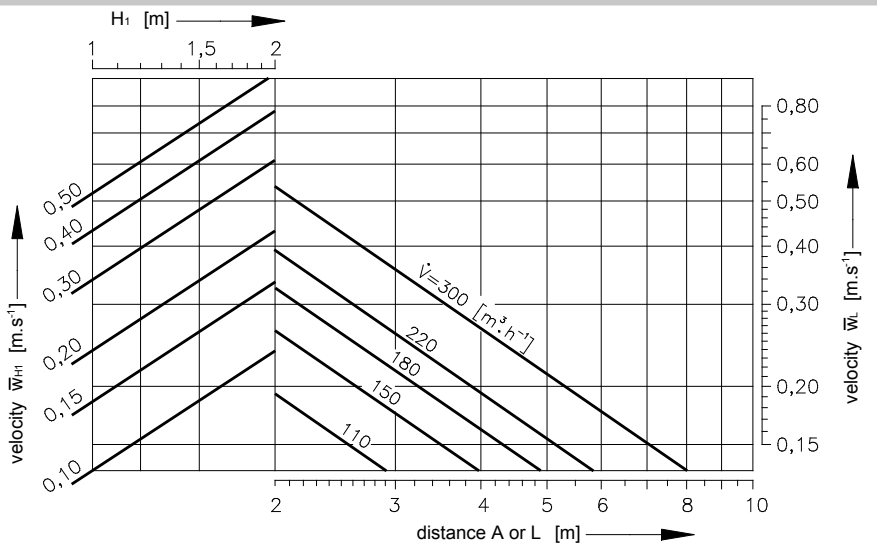


Chart 6.4.2. Velocity of airflow - size 250, I model of face plate

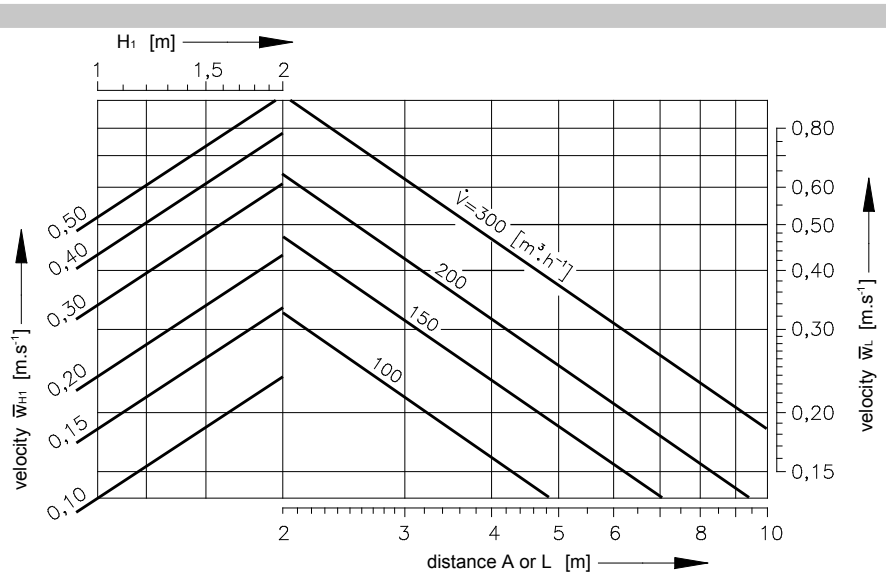


Chart 6.4.3. Velocity of airflow - size 250, H model of face plate

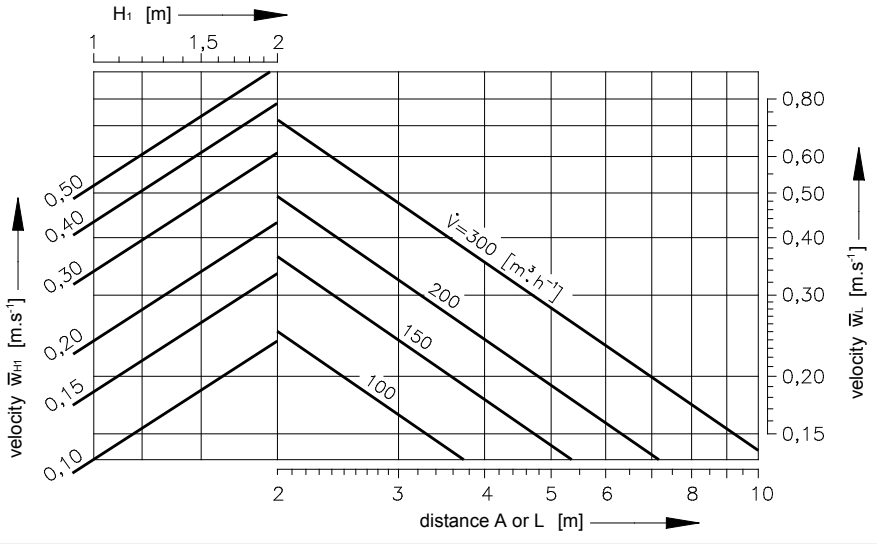


Chart 6.4.4. **Velocity of airflow - size 250, L model of face plate**

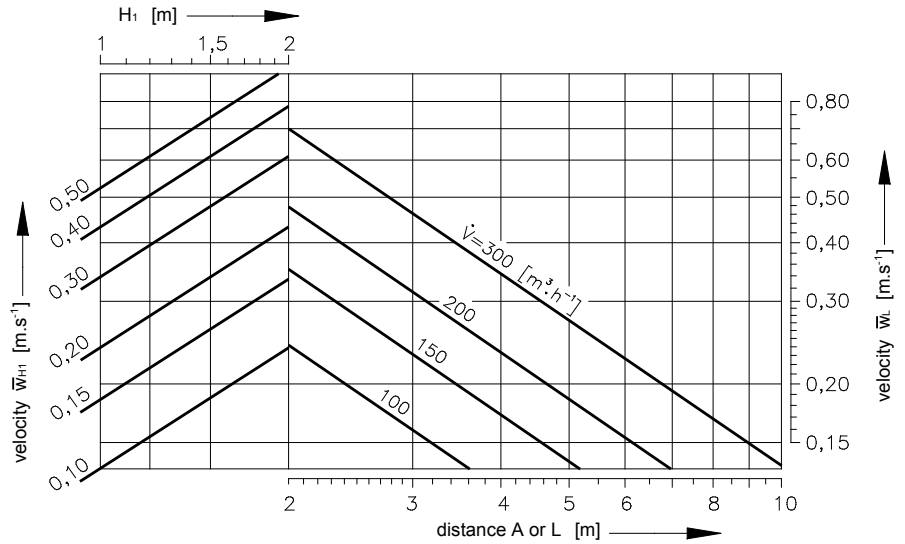


Chart 6.4.5. **Velocity of airflow - size 250, U model of face plate**

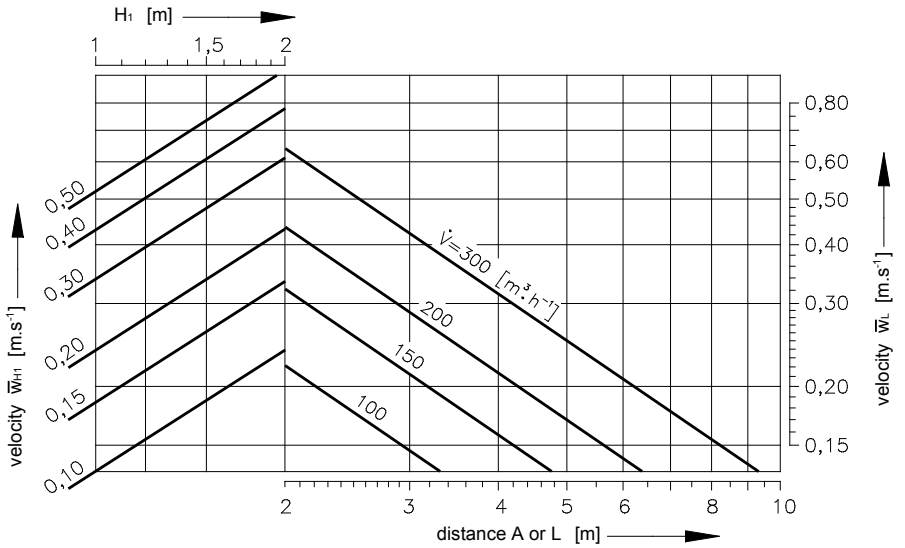


Chart 6.4.6. **Velocity of airflow - size 300, basic model of face plate**

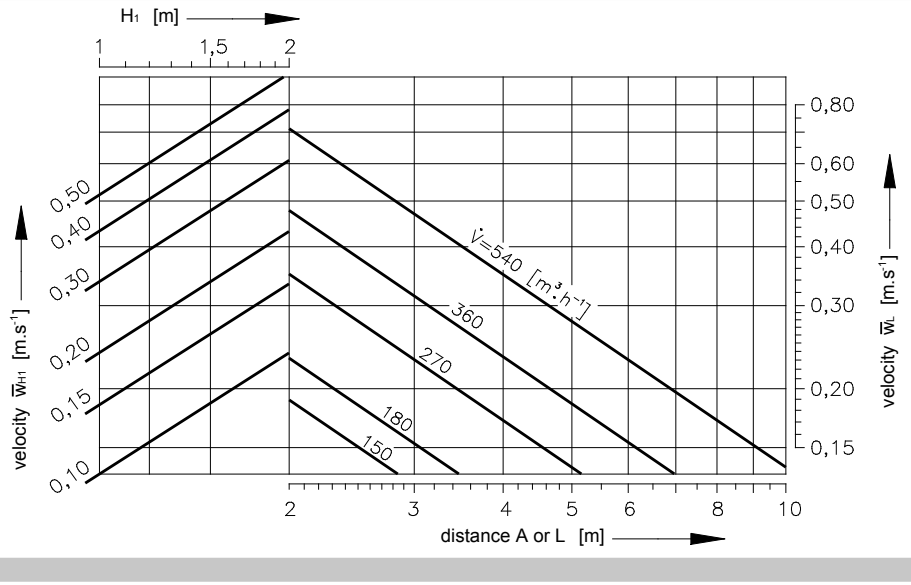


Chart 6.4.7. **Velocity of airflow - size 300, I model of face plate**

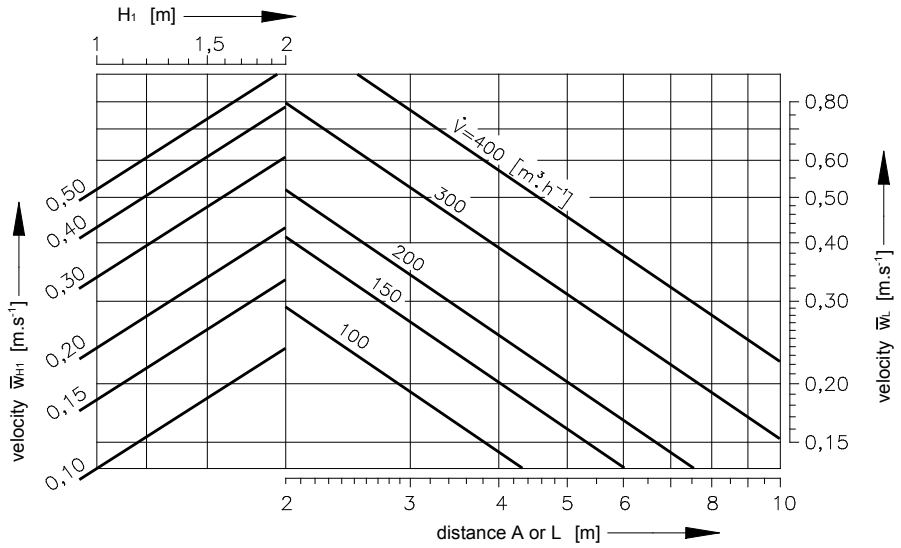


Chart 6.4.8. **Velocity of airflow - size 300, H model of face plate**

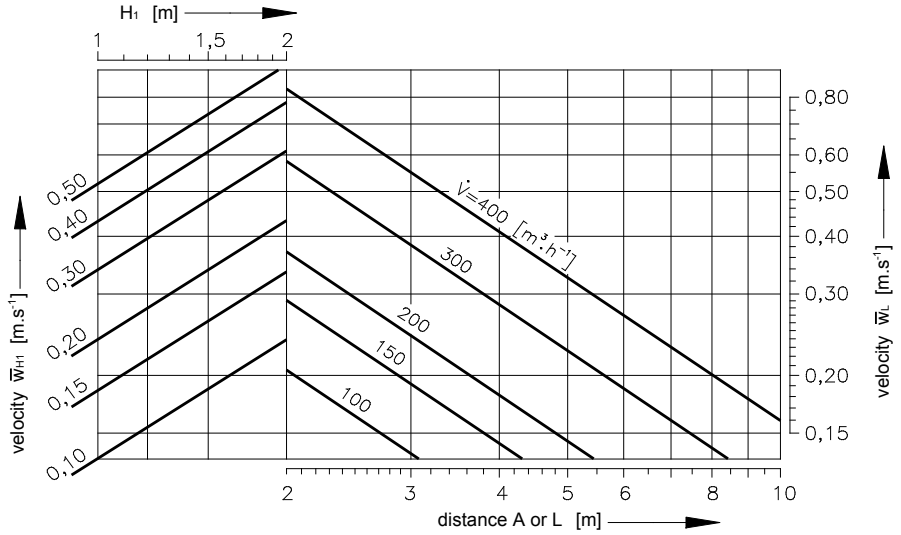


Chart 6.4.9. **Velocity of airflow - size 300, L model of face plate**

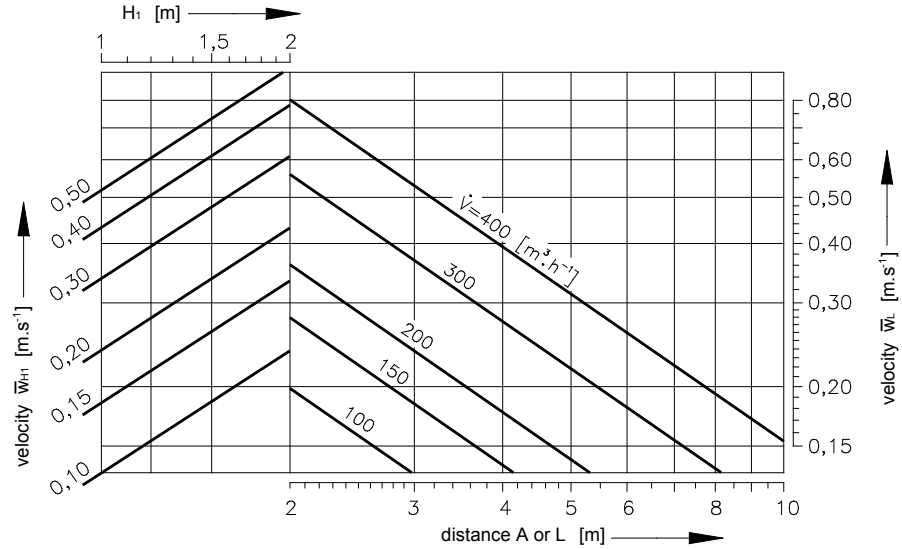


Chart 6.4.10. **Velocity of airflow - size 300, U model of face plate**

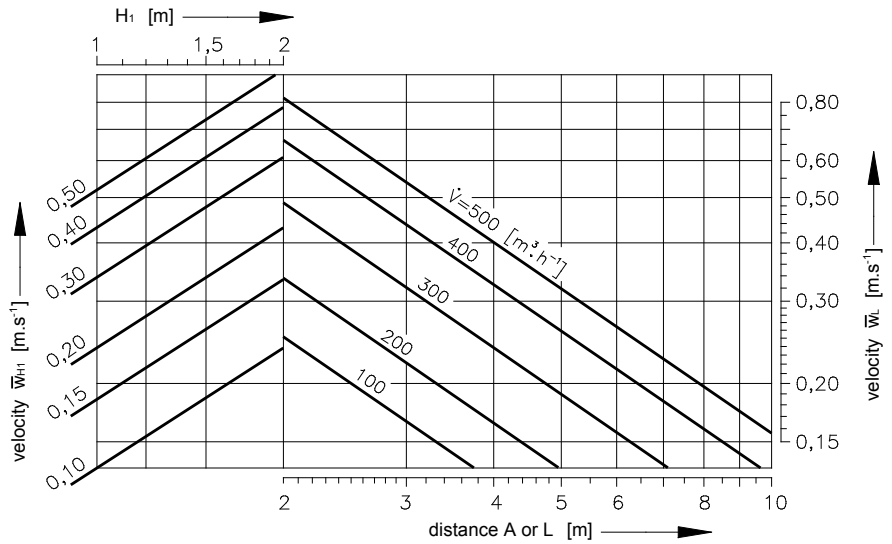


Chart 6.4.11. **Velocity of airflow - size 400, basic model of face plate**

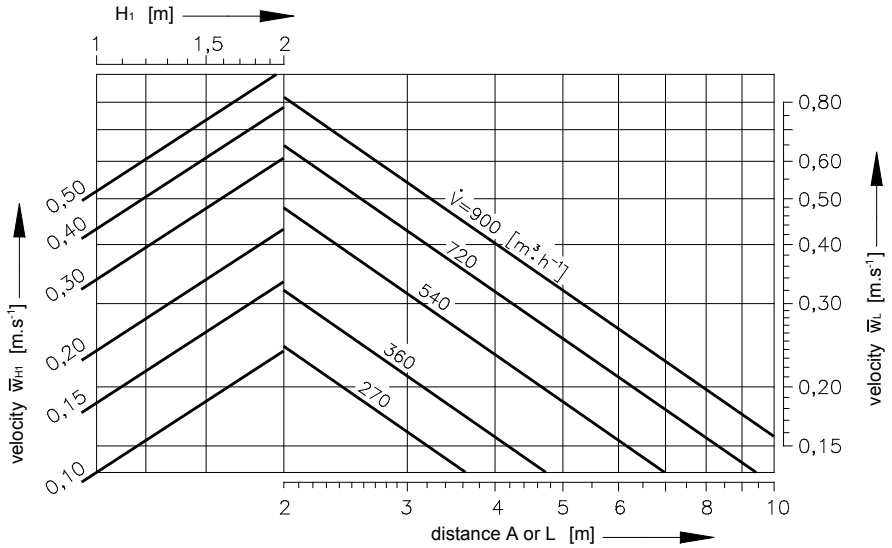


Chart 6.4.12. **Velocity of airflow - size 400, I model of face plate**

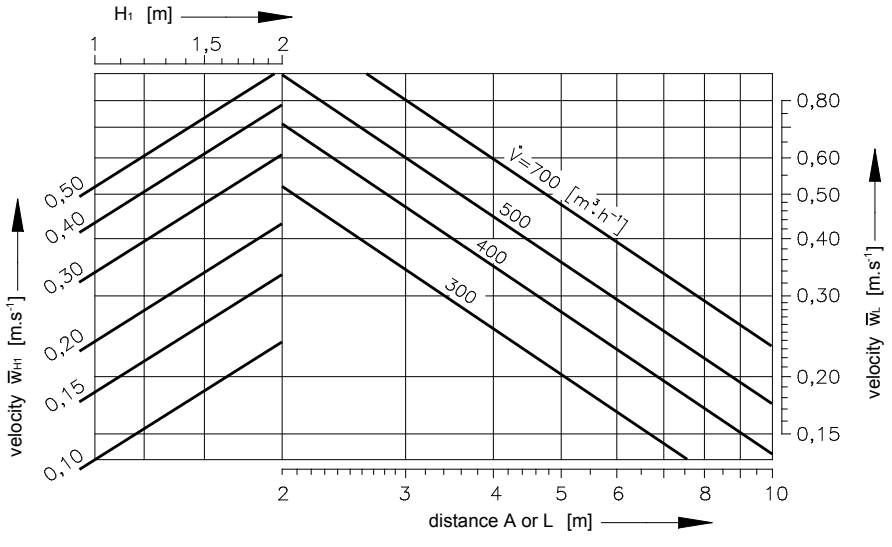


Chart 6.4.13. Velocity of airflow - size 400, H model of face plate

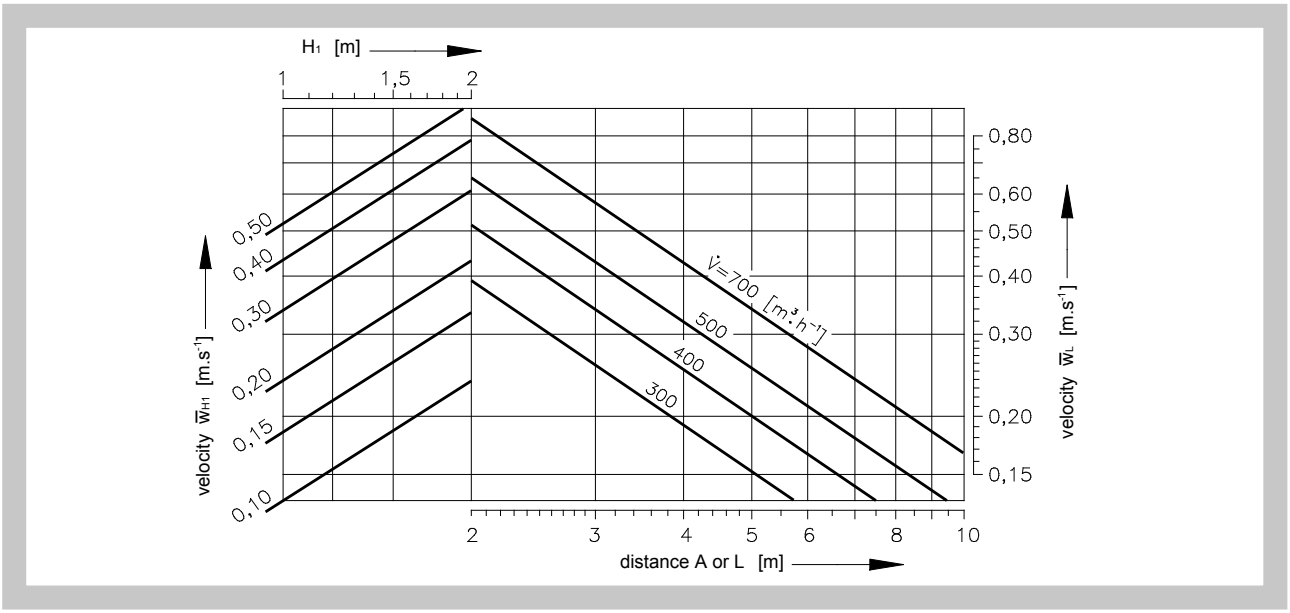


Chart 6.4.14. Velocity of airflow - size 400, L model of face plate

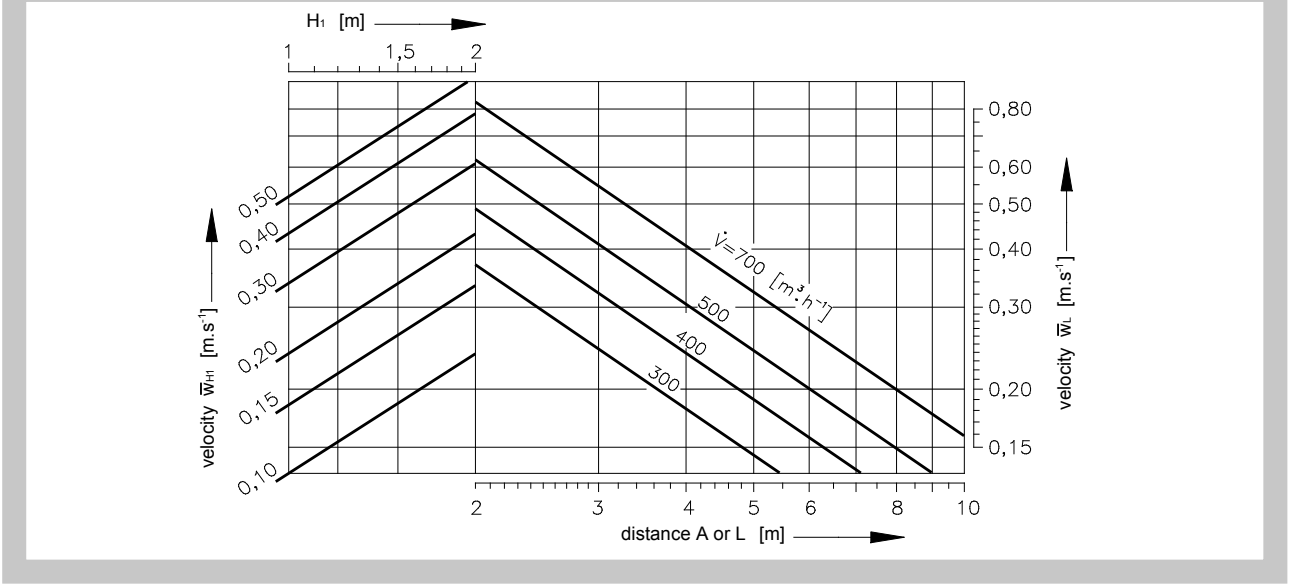


Chart 6.4.15. Velocity of airflow - size 400, U model of face plate

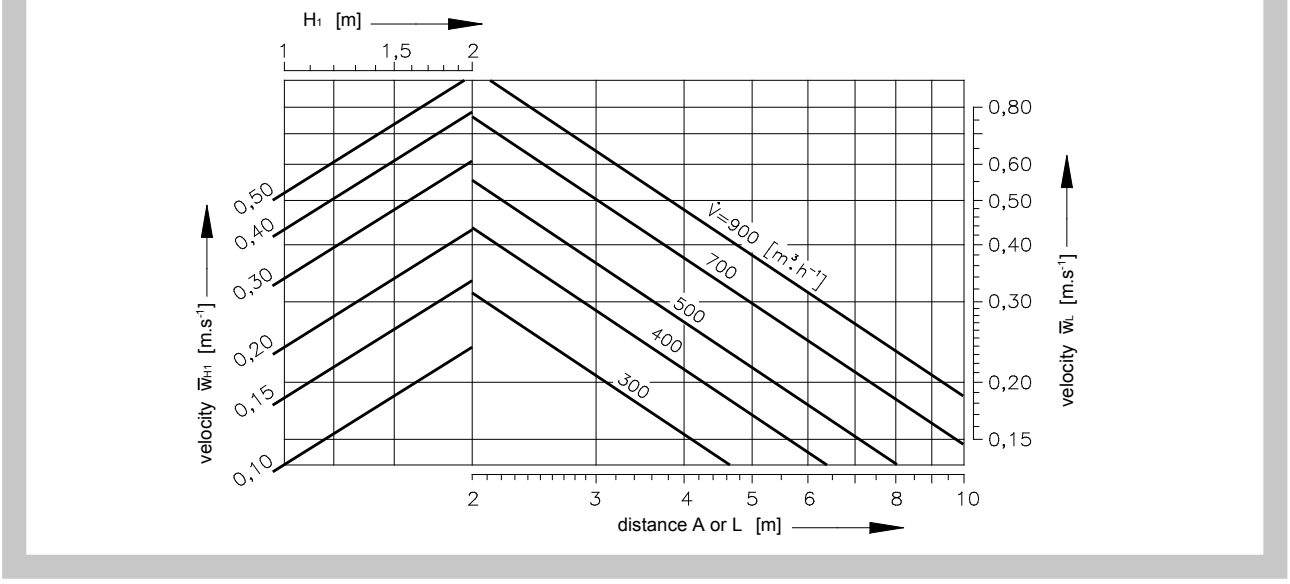


Chart 6.4.16. **Velocity of airflow - size 500, basic model of face plate**

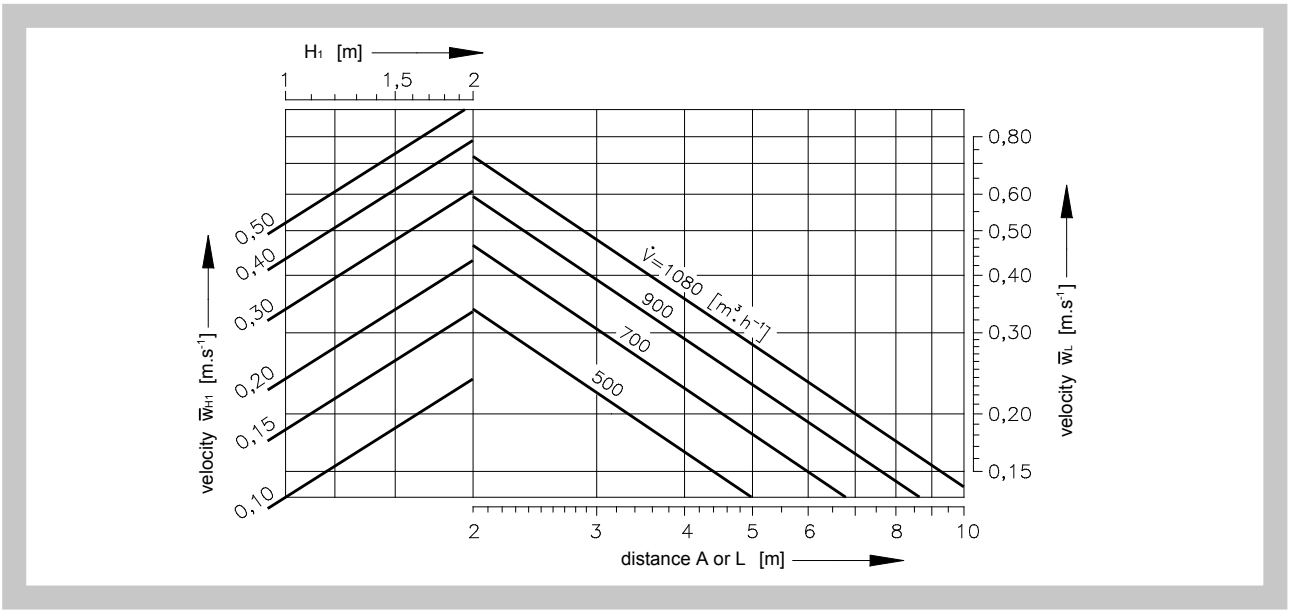


Chart 6.4.17. **Velocity of airflow - size 500, I model of face plate**

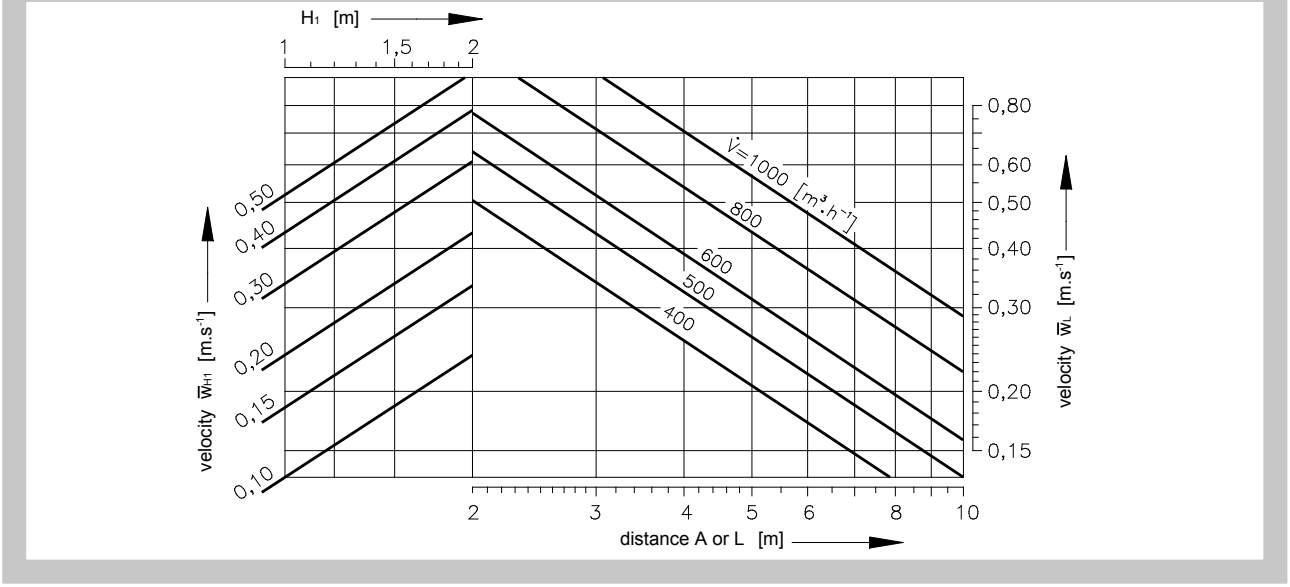


Chart 6.4.18. **Velocity of airflow - size 500, H model of face plate**

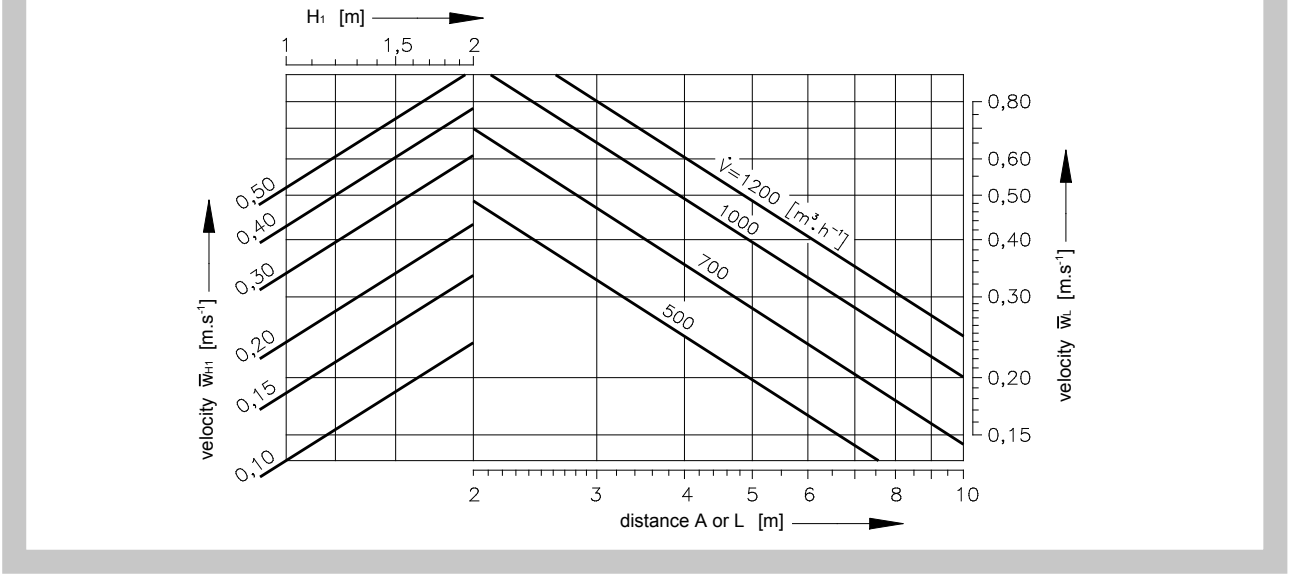


Chart 6.4.19. Velocity of airflow - size 500, L model of face plate

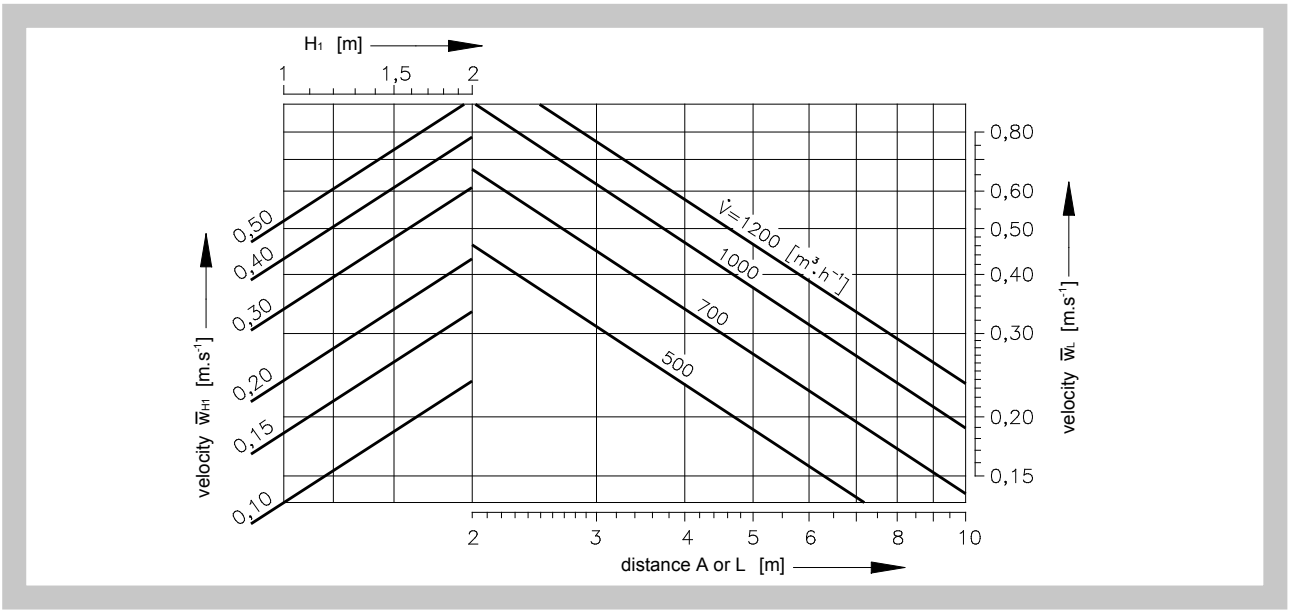


Chart 6.4.20. Velocity of airflow - size 500, U model of face plate

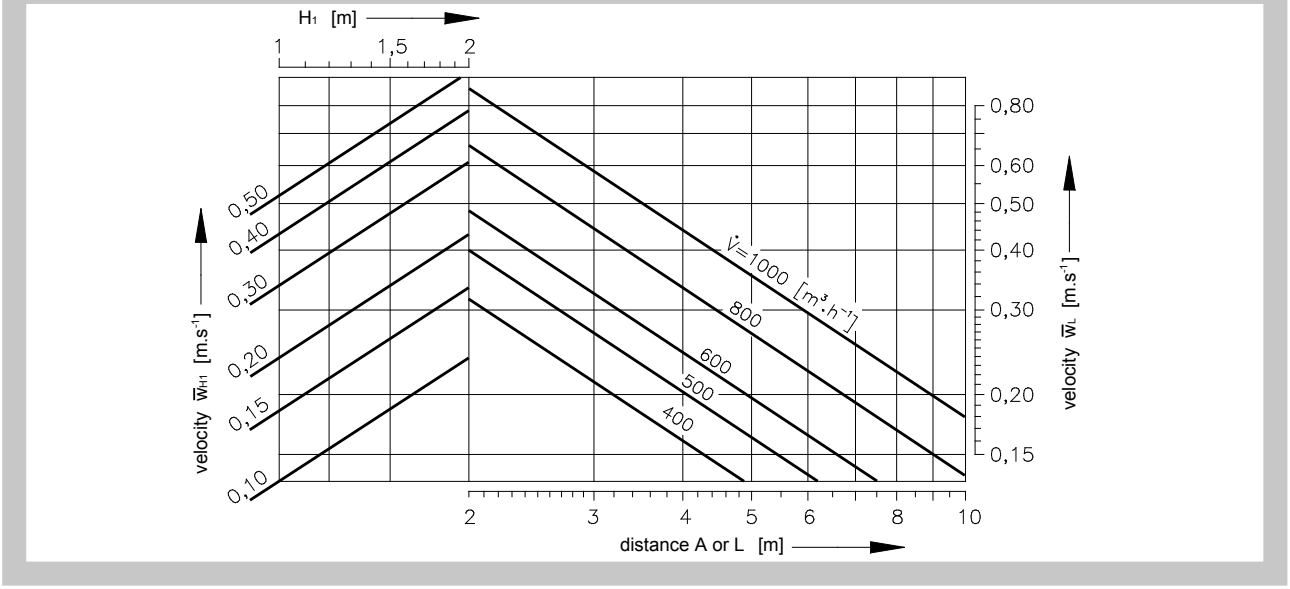


Chart 6.4.21. Velocity of airflow - size 600, basic model of face plate

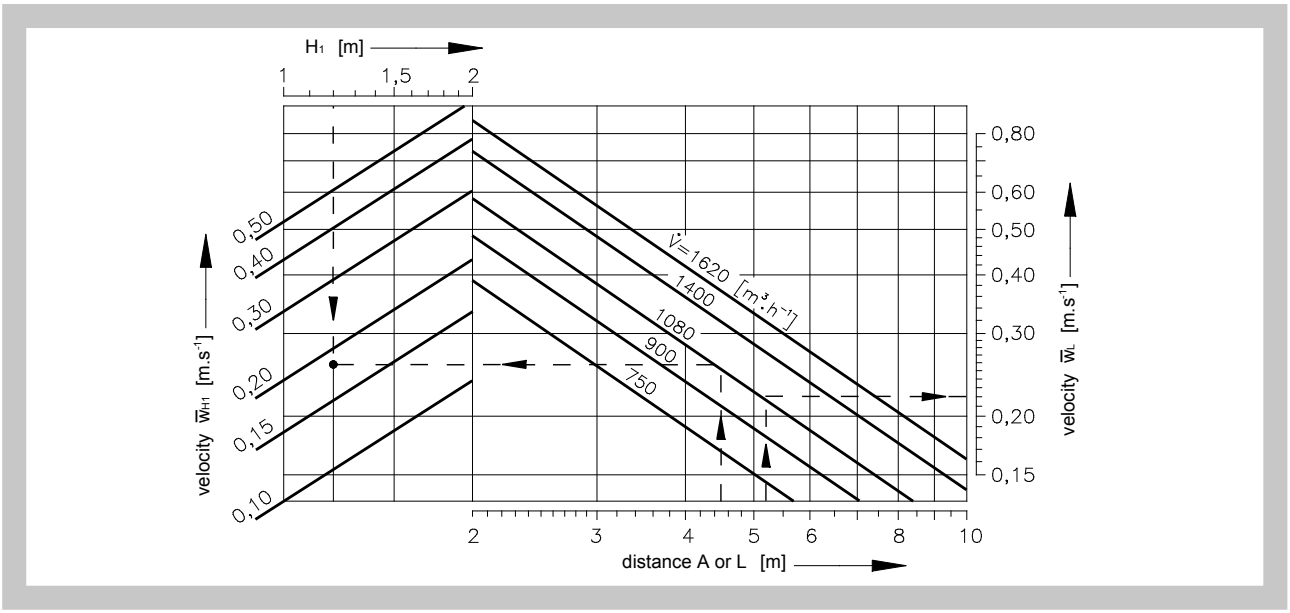


Chart 6.4.22. **Velocity of airflow - size 600, I model of face plate**

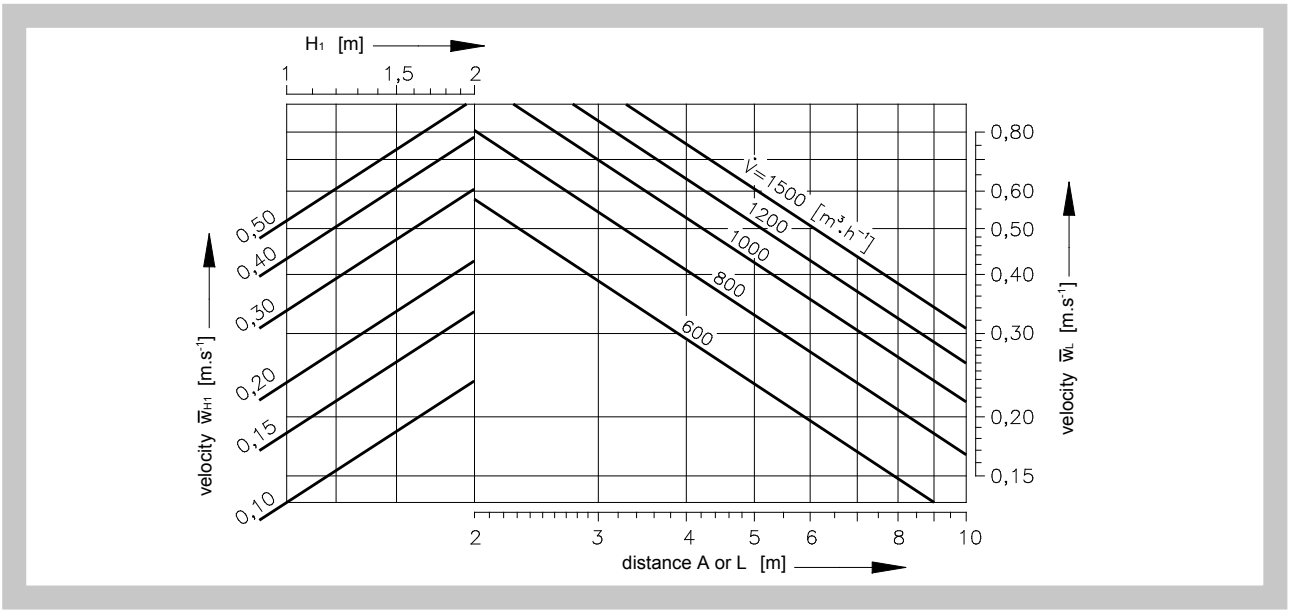


Chart 6.4.23. **Velocity of airflow - size 600, H model of face plate**

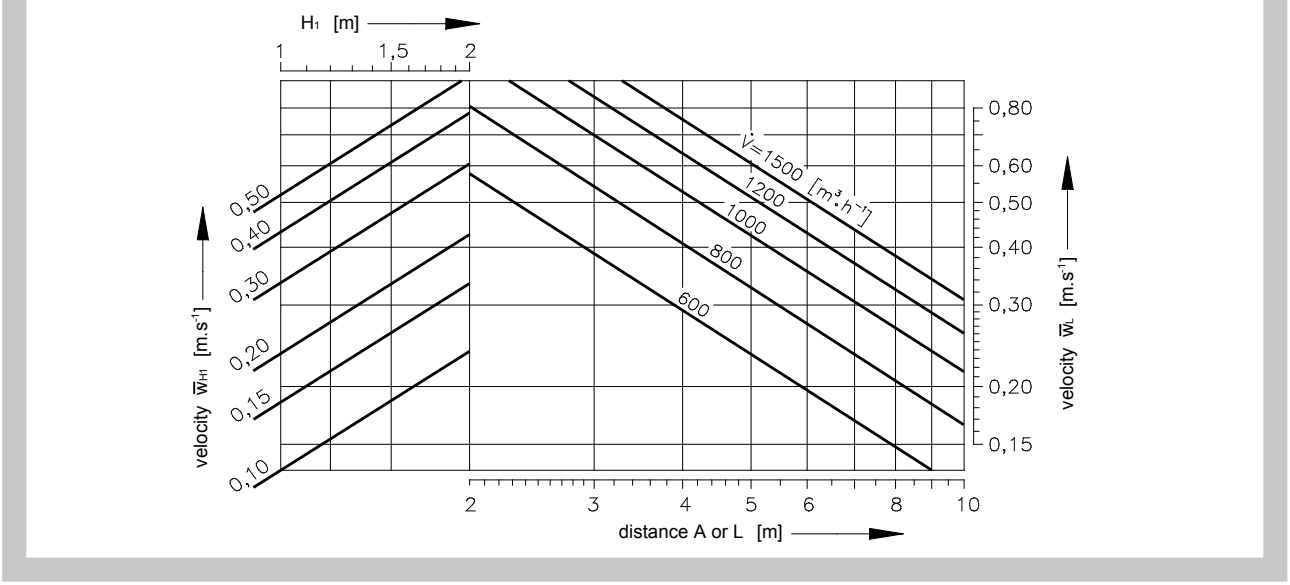


Chart 6.4.24. **Velocity of airflow - size 600, L model of face plate**

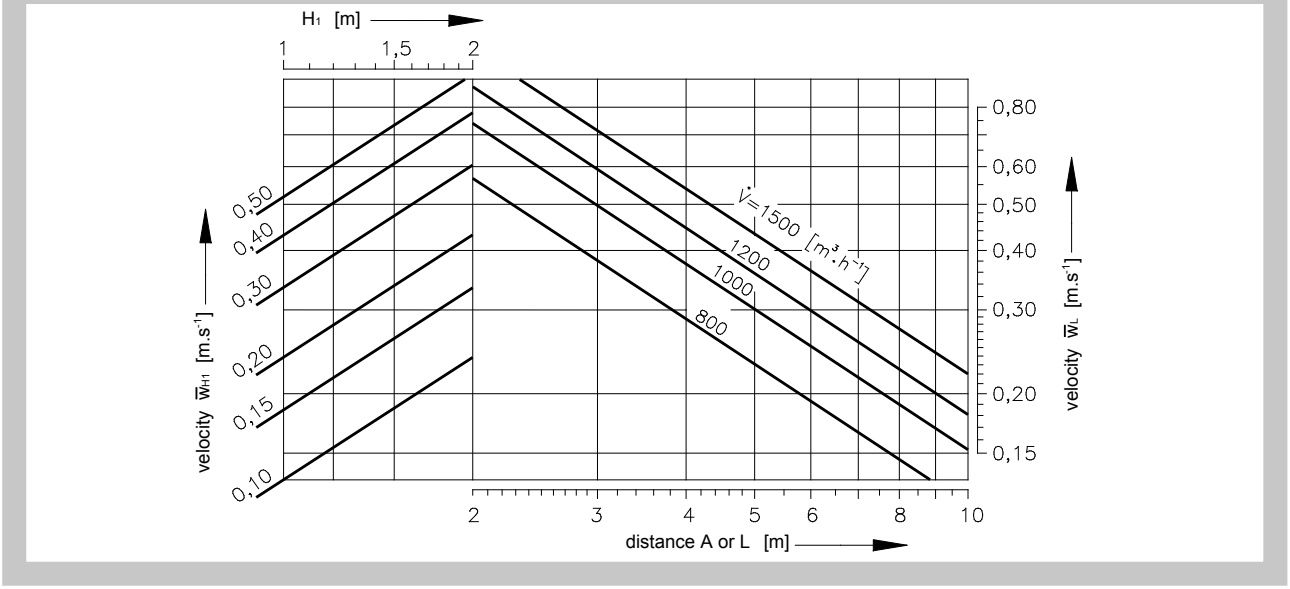


Chart 6.4.25. Velocity of airflow - size 600, U model of face plate

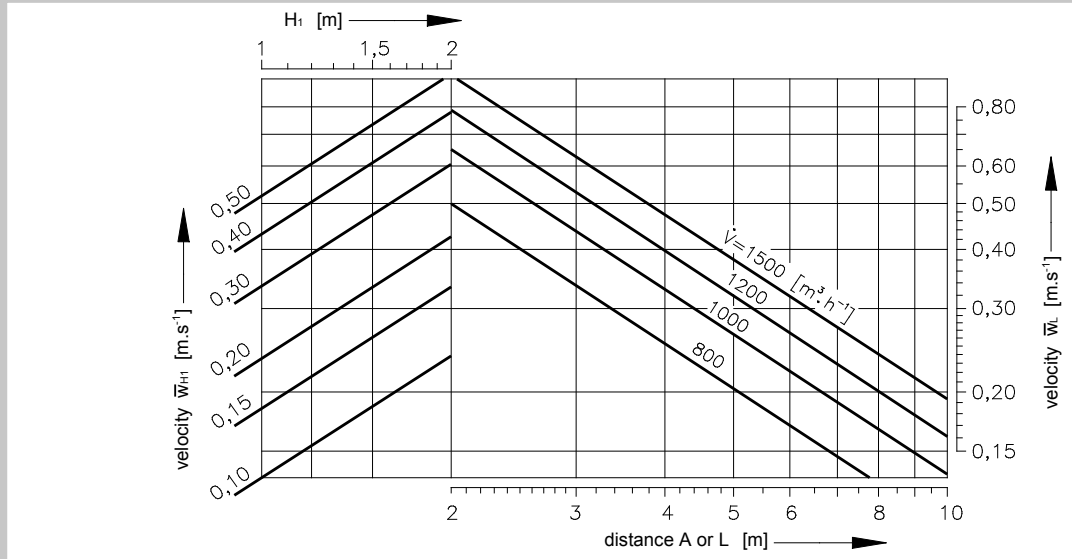


Chart 6.4.26. Velocity of airflow - size 625, basic model of face plate

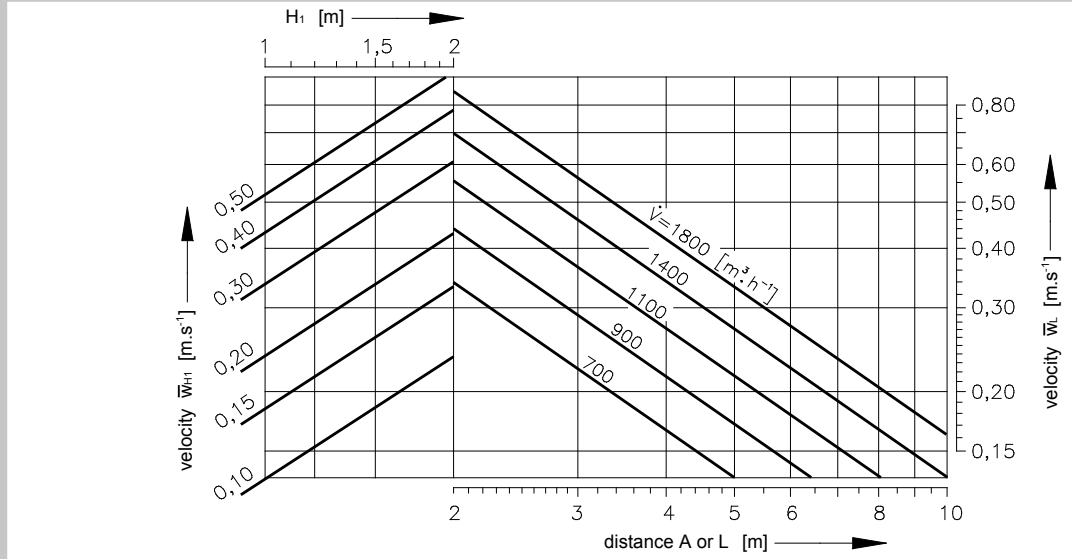


Fig. 9 Example

Given data:	Anemostat ALCM 600 -/P	A = 6,5 m
	$\dot{V}$ = 1100 m³.h⁻¹	X = 4,0 m
	Δt_p = - 6 K	L = 5,2 m (to the wall)
	H_1 = 1,2 m	angle of flap 0°
Chart 6.2.1. :	L_{WA} = 40 dB(A)	
	Δp_c = 22 Pa	
Chart 6.3.1. :	L = A/2 + H_1 = 4,45 m	between anemostats
	$\Delta t_L / \Delta t_p$ = 0,14	
	Δt_L = - 6 * 0,14 = - 0,84 K	
	L = X + H_1 = 5,2 m	on the wall
	$\Delta t_L / \Delta t_p$ = 0,11	
	Δt_L = - 8 * 0,11 = - 0,66 K	
Chart 6.4.21. :	w_{H1} = 0,18 m.s⁻¹	between anemostats
	w_L = 0,22 m.s⁻¹	on the wall

IV. ORDERING INFORMATION

7. Ordering key

ALCM 600 I/P/R TPM 003/97

- Technical conditions
- R – with regulating flap on the connecting box (only for P and O model)
- – without regulating flap
- P – air supply (from the connecting box)
- O – air outlet (with the connecting box)
- Z – vertical on square piping with regulation
- R1 – compact with regulation R1
- \- – basic model of face plate
- I – I model of face plate
- H – H model of face plate
- L – L model of face plate
- U – U model of face plate
- Size
- Type

V. MATERIAL, FINISHING

8. Material

8.1. Face lamellas and frames are made of steel sheet. The surface is provided with white stove-enamel in shade RAL 9010. There is necessary to discuss the requirements for the other shade of face plates with the manufacturer.

8.2. The connecting boxes are made of zinc−coated steel sheet.

VI. ASSEMBLY

9. Adjusting regulation R1

Fig. 10 Anemometers for the connection on the square piping - way of the regulation adjustment

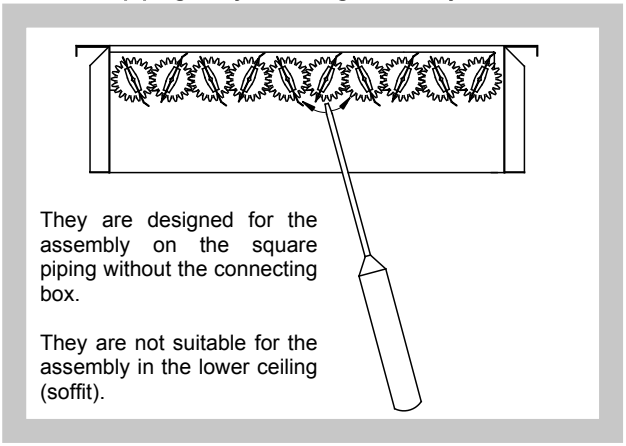
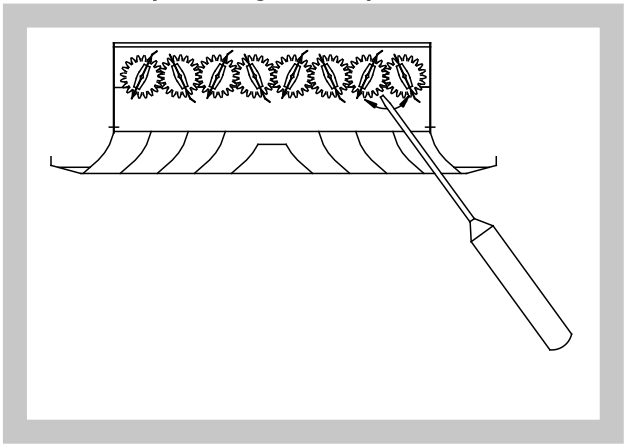


Fig. 11 Compact anemostat with the regulation R1 - way of the regulation adjustment



VII. TRANSPORTATION AND STORAGE

10. Logistics terms

10.1. Anemostats are delivered in cardboard packaging. They are transported in bulk by common means of transport. If agreed with the customer, the outlets can be delivered on pallets. When handling during transport or storage, the outlets must be protected against mechanical damage and weather effects.

10.2. If not otherwise agreed, the handover is considered when the goods is forwarded to the carrier.

10.3. Anemostats must be stored in closed rooms, in environment without aggressive vapours, gases and dust. The temperature in the rooms must be maintained from -5 to +40°C and relative humidity max. 80%.

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