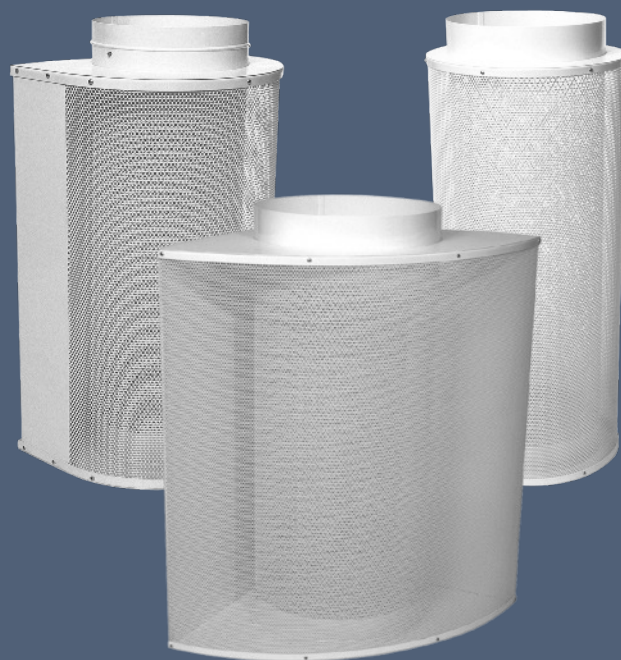


MANDÍK[®]

LARGE-AREA VENT

VPVM



These technical conditions define a series of the manufactured sizes and versions of the following large-area vents (hereinafter vents): VPVM – K 400, 600, 800, 1000, 1200, 1480, VPVM – S 400, 600, 800, 1000, 1200, 1500, 2000, VPVM – R 800, 1000, 1200, 1400, 1600, 2000 , heights of 750, 1000, 1250, 1500 and 2000 mm. They apply to manufacturing, designing, ordering, deliveries, installation and operation.

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I. GENERAL

1. Description

1.1. Large-area vents are terminal air-conditioning elements for the distribution of air in air-conditioned and ventilated rooms.

They are intended for the inlet of treated outdoor air directly into the living (working) area.

In order to ensure stabilized air flow in the living area, the temperature of inlet air must be lower by 1 to 3°C than the temperature of air in the ventilated room.

Outdoor air is let in with low velocity at the floor, to take harmful substances from the living area to ceiling.

1.2. The vents 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.

Vents 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. The following types of vents are supplied: round outlets to be installed into a space, wall-mounted outlets with semi-circled ground plan, and corner vents with quarter-circled ground plan. Piping is connected to vents from above to round connecting socket. Vents are supplied with or without control flaps.

3. Dimensions and weights

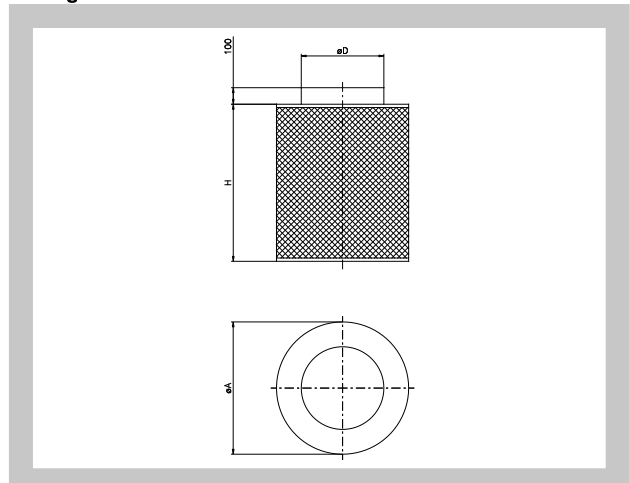
3.1. Dimensions

Tab. 3.1.1 Round vent VPVM - K

Size	ØA	ØD
400	400	313
600	600	498
800	800	558
1000	1000	628
1200	1200	708
1480	1480	798

Height H: 750, 1000, 1250, 1500 and 2000 mm

Fig. 1

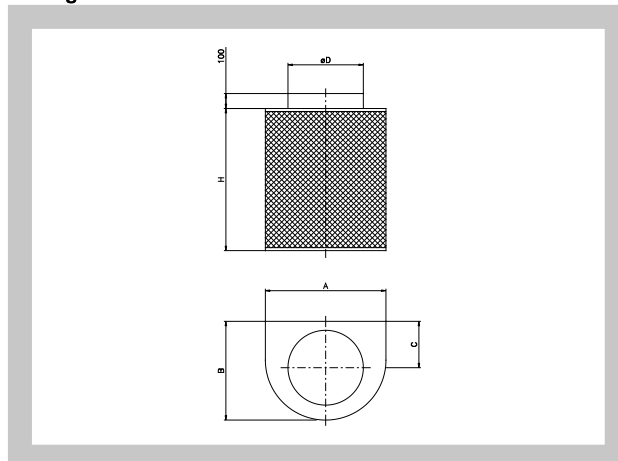


Tab. 3.1.2. Wall-mounted vent VPVM - S

Size	A	B	C	øD
400	400	330	155	248
600	600	490	235	398
800	800	550	265	448
1000	1000	620	290	498
1200	1200	700	320	558
1500	1500	850	370	628
2000	2000	1100	480	798

Height H: 750, 1000, 1250, 1500 a 2000 mm

Fig. 2

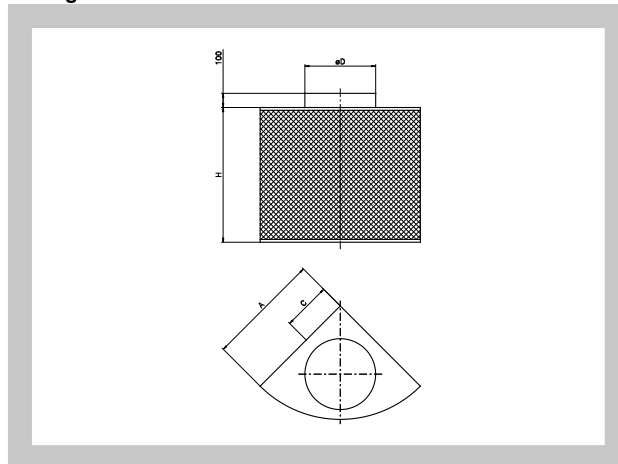


Tab. 3.1.3. Corner vent VPVM - R (90°)

Size	A	C	øD
800	400	170	248
1000	500	210	313
1200	600	250	398
1400	700	290	448
1600	800	330	448
2000	1000	390	498

Height H: 750, 1000, 1250, 1500 and 2000 mm

Fig. 3



3.2. Weights

Tab. 3.2.1. Weights [kg]

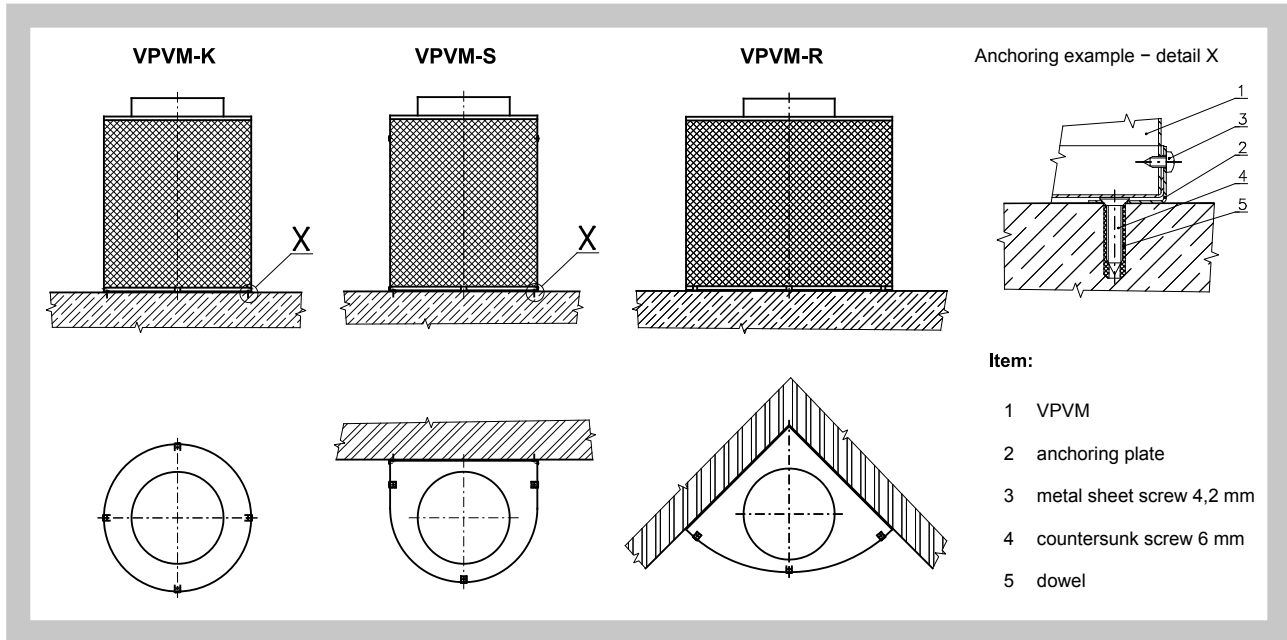
	Size	Vent height					Control
		750	1000	1250	1500	2000	
VPVM-K	400	8,8	11,0	13,0	14,5	18,5	0,8
	600	14,0	17,0	20,0	23,0	29,0	1,7
	800	20,0	24,0	27,0	31,0	38,0	2,0
	1000	27,0	31,0	35,5	40,0	48,5	2,5
	1200	35,0	40,0	45,0	50,0	60,0	3,0
	1480	46,5	53,0	59,0	65,0	77,0	3,7
VPVM-S	400	11,0	13,0	16,0	18,5	24,0	0,6
	600	17,0	21,0	25,0	29,0	37,0	1,2
	800	21,0	26,0	30,0	35,0	44,0	1,4
	1000	25,5	31,0	36,0	41,5	52,0	1,6
	1200	30,5	36,5	43,0	49,0	61,0	2,0
	1500	37,0	47,0	54,5	62,0	76,5	2,5
VPVM-R	2000	58,0	67,0	77,0	86,0	106,0	3,7
	800	12,0	15,0	17,5	20,5	26,5	0,6
	1000	15,0	19,0	22,5	26,0	33,5	0,8
	1200	19,0	23,5	28,0	32,0	41,0	1,2
	1400	23,0	28,0	33,0	38,0	48,5	1,4
	1600	26,5	32,0	38,0	43,5	55,0	1,4
	2000	35,0	42,0	49,0	56,0	70,0	1,7

Note: The weights provided apply to outlets without control equipment. For versions including control equipment, the weight of the control equipment has to be added.

4. Placement and installation

4.1. Round vents VPVM – K are intended for installation in free space, to be anchored to the floor. Wall-mounted vents VPVM – S and corner vents VPVM – R are installed onto walls and in corners, to be anchored either to the floor or to the wall (in the corner).

Fig. 4 Floor-mounting example



Large vent supply includes 6 anchoring plates (Pos. 2) and 6 metal-sheet screws, 4,2 mm (Pos. 3). Connecting material (Pos. 4 and 5) is not included in the supply.

III. TECHNICAL DATA

5. Basic parameters

5.1. Maximum air-flow through the vent

Tab. 5.1.1. Maximum air-flow through the vent \dot{V} [m³.h⁻¹]

	Size	socket ø D	Vent height H				
			750	1000	1250	1500	2000
VPVM-K	400	313	1250	1400	1500	1650	1800
	600	498	2400	2600	2900	3100	3300
	800	558	3100	3450	3600	3900	4200
	1000	628	3800	4230	4500	4800	5300
	1200	708	4700	5300	5500	6000	6500
	1480	798	6100	6660	7000	7660	8100
VPVM-S	400	248	660	730	770	830	900
	600	398	1400	1530	1700	1800	1900
	800	448	1800	2000	2100	2250	2450
	1000	498	2200	2430	2600	2800	3000
	1200	558	2750	3050	3200	3450	3700
	1500	628	3450	3800	4000	4300	4600
	2000	798	5150	5800	6000	6500	7000
VPVM-R	800	248	660	730	770	830	900
	1000	313	1150	1200	1400	1500	1600
	1200	398	1400	1530	1700	1750	1900
	1400	448	1600	1750	1800	2000	2150
	1600	448	1800	2000	2100	2250	2450
	2000	498	2200	2430	2600	2800	3000

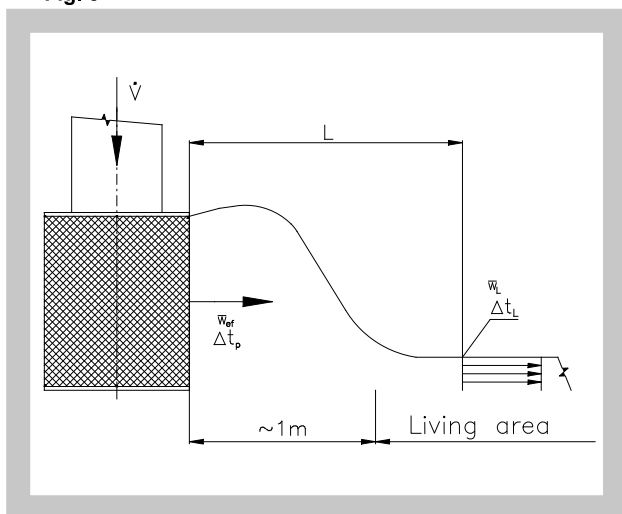
5.2. Effective area

Tab. 5.2.1. Effective area

Effective area S_{ef} [m ²]		
VPVM - K	$\pi \cdot D \cdot H \cdot K$	K = 0,63
VPVM - S	$0,5 \cdot \pi \cdot A \cdot H \cdot K$	
VPVM - R	$0,25 \cdot \pi \cdot A \cdot H \cdot K$	

6. Calculation and determination quantities

Fig. 5



- \dot{V} [m³/h] volumetric airflow rate for one vent
- Δp_c [Pa] total pressure loss at $\rho = 1,2 \text{ kg/m}^3$
- w_{ef} [m.s⁻¹] effective velocity
- L_{WA} [dB(A)] acoustic power level
- S_{ef} [m²] effective area
- L [m] length of flow
- \bar{w}_L [m.s⁻¹] flow velocity in L distance from vent
- Δt_p [K] difference between inlet air temperature and room air temperature
- Δt_L [K] difference between room air temperature and flow air temperature in L distance

6.1. Pressure losses and acoustic powers

Tab. 6.1.1. Correction to vent height (applicable to diagrams 6.1.1. to 6.1.3.)

	Vent height H				
	750	1000	1250	1500	2000
Δp_c	x 1,1	x 1	x 0,9	x 0,8	x 0,8
L_{WA}	+ 1	0	- 1	- 1	- 2

Chart 6.1.1. VPVM - K

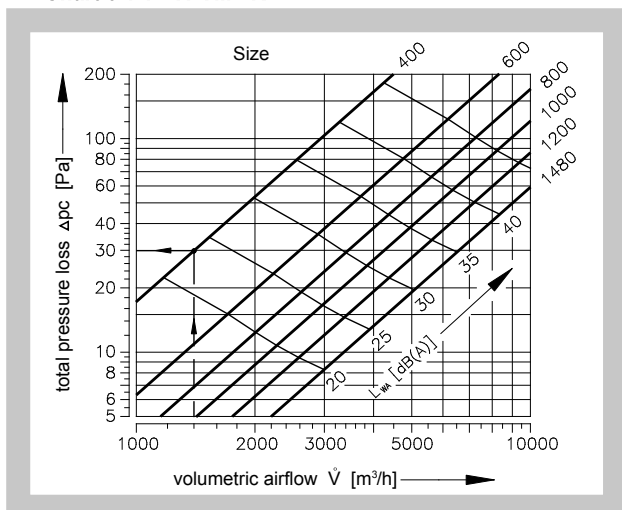


Chart 6.1.2. VPVM - S

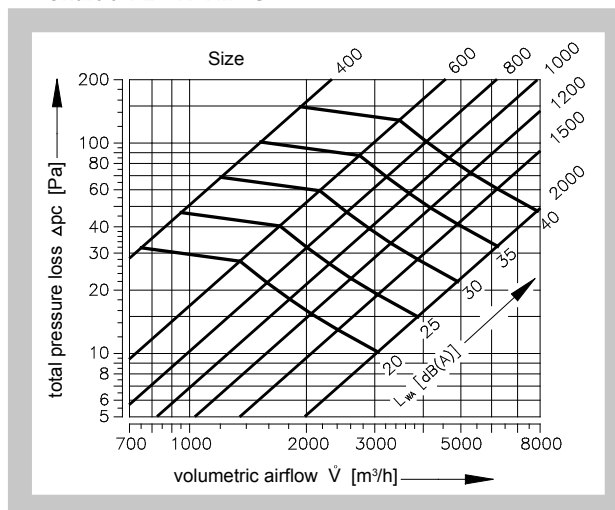
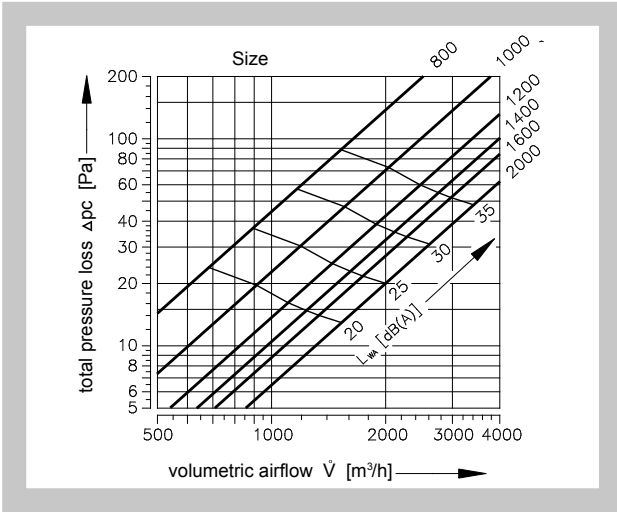


Chart 6.1.3. VPVM - R



6.2. Flow velocity and temperature coefficient

Tab. 6.2.1. Correction to vent height (applicable to diagrams 6.2.1. to 6.2.19.)

	Vent height H				
	750	1000	1250	1500	2000
V_L	x 0,95	x 1	x 1,05	x 1,1	x 1,15
$\Delta t_L/\Delta t_p$	x 0,65	x 0,7	x 0,75	x 0,8	x 0,9

Chart 6.2.1. VPVM - K 400

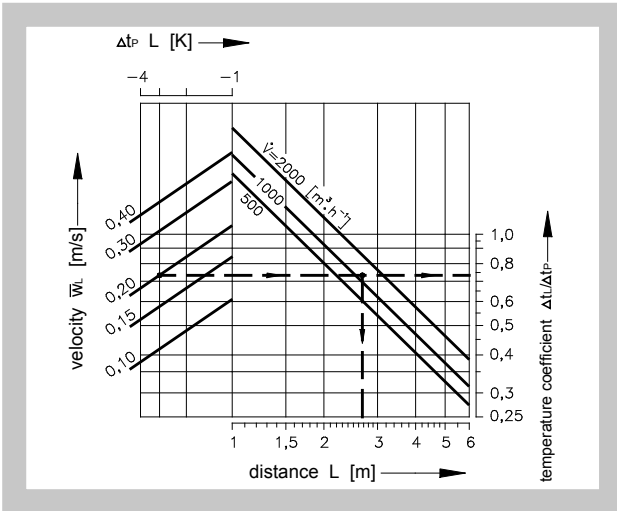


Chart 6.2.2. VPVM - K 600

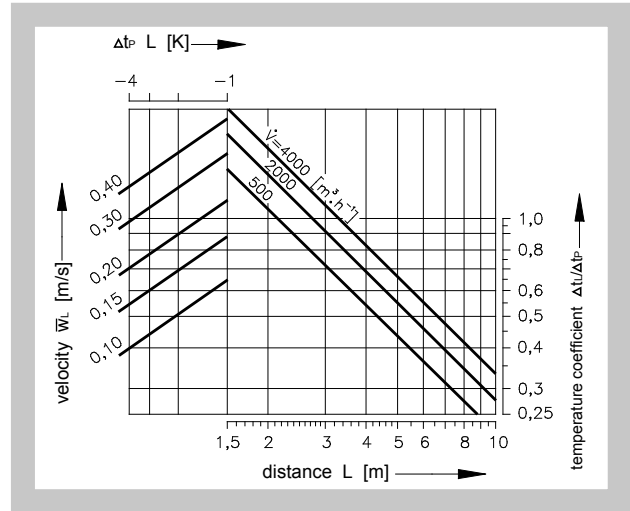


Chart 6.2.3. VPVM - K 800

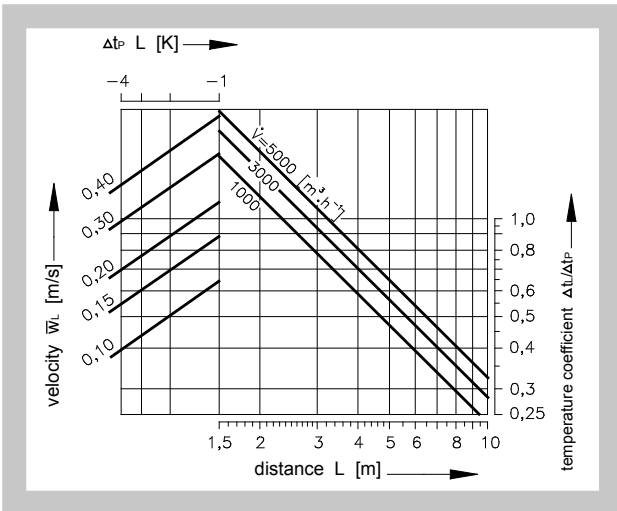


Chart 6.2.4. VPVM - K 1000

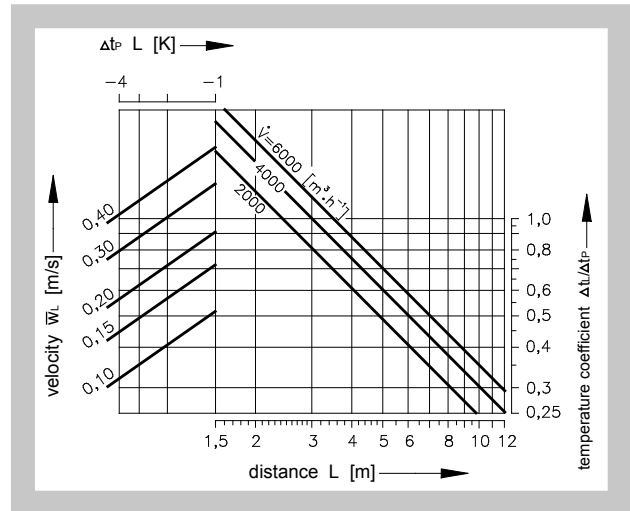


Chart 6.2.5. VPVM - K 1200

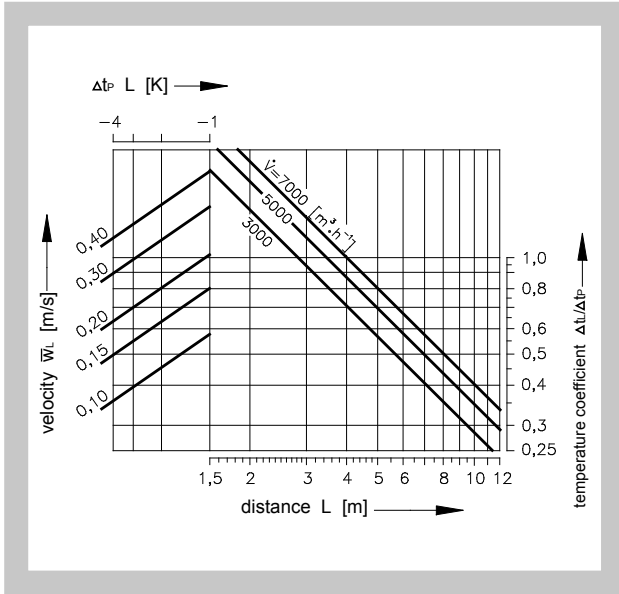


Chart 6.2.6. VPVM - K 1480

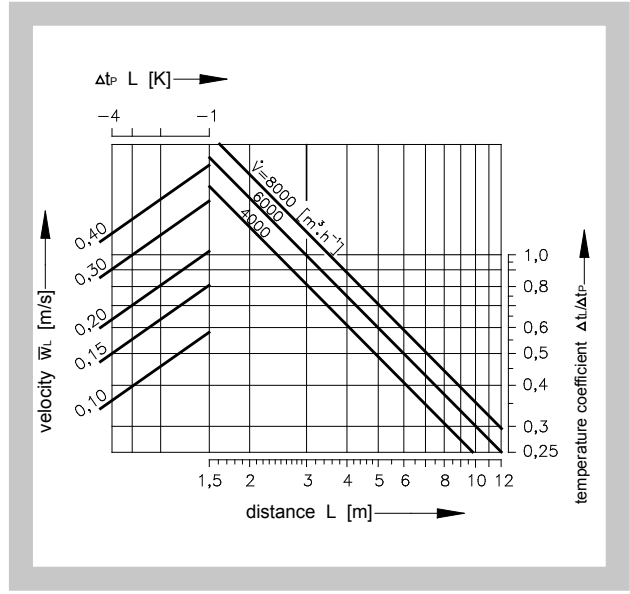


Chart 6.2.7. VPVM - S 400

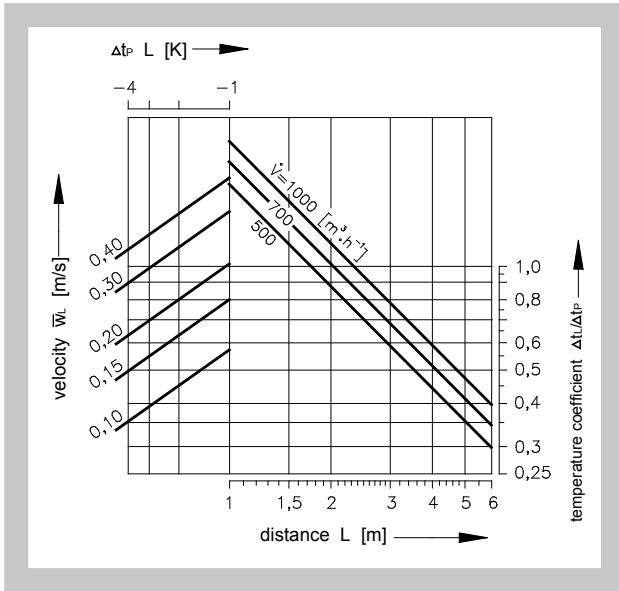


Chart 6.2.8. VPVM - S 600

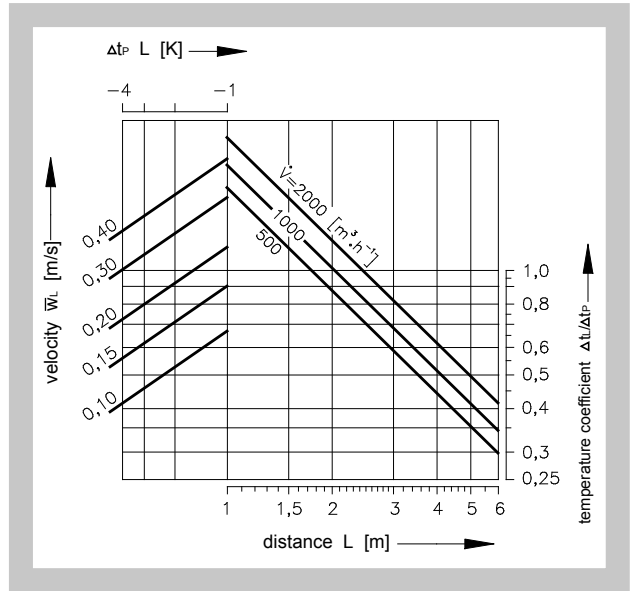


Chart 6.2.9. VPVM - S 800

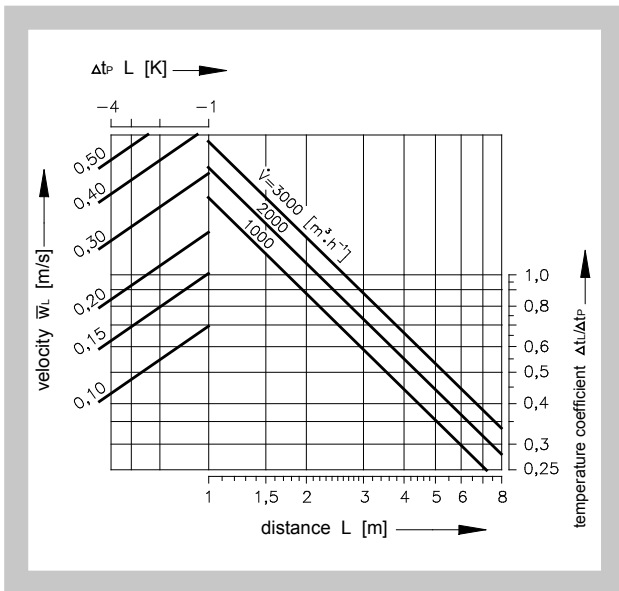


Chart 6.2.10. VPVM - S 1000

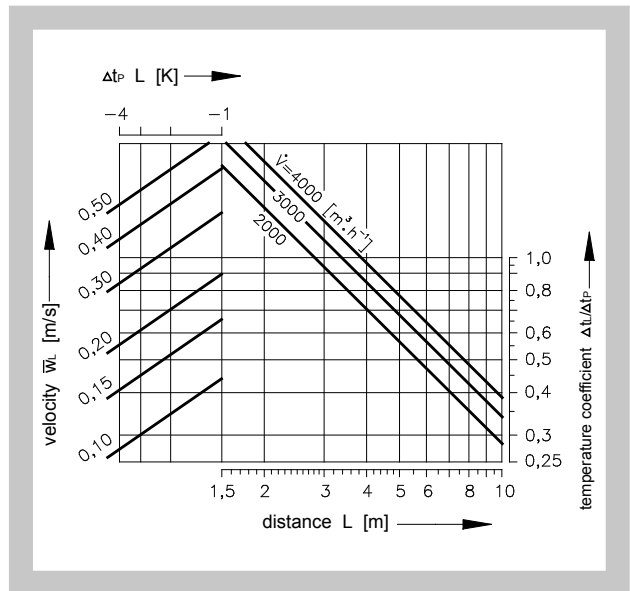


Chart 6.2.11. VPVM - S 1200

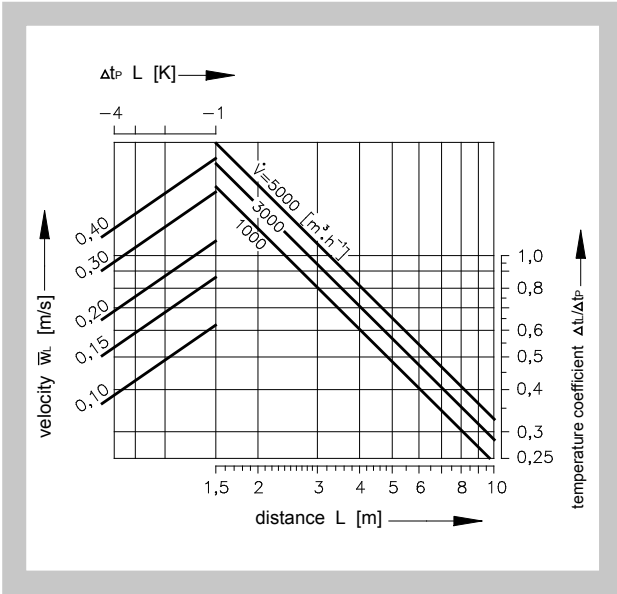


Chart 6.2.12. VPVM - S 1500

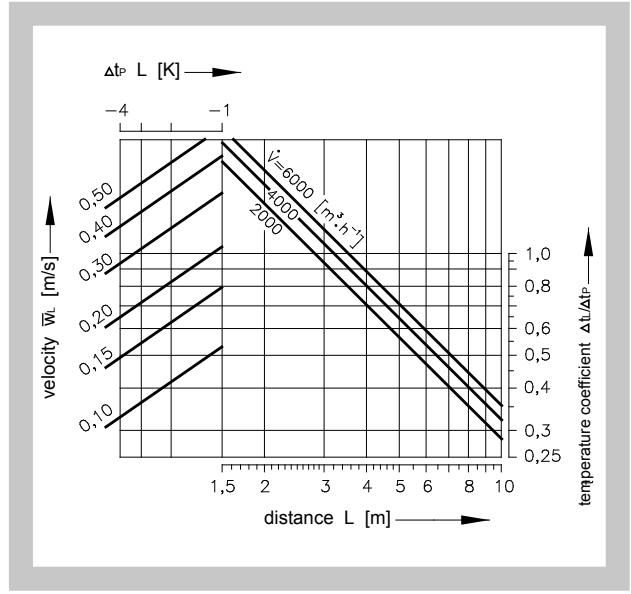


Chart 6.2.13. VPVM - S 2000

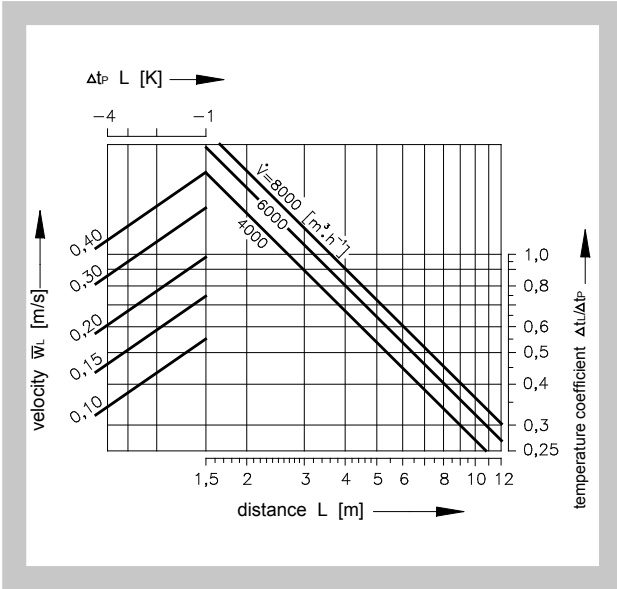


Chart 6.2.14. VPVM - R 800

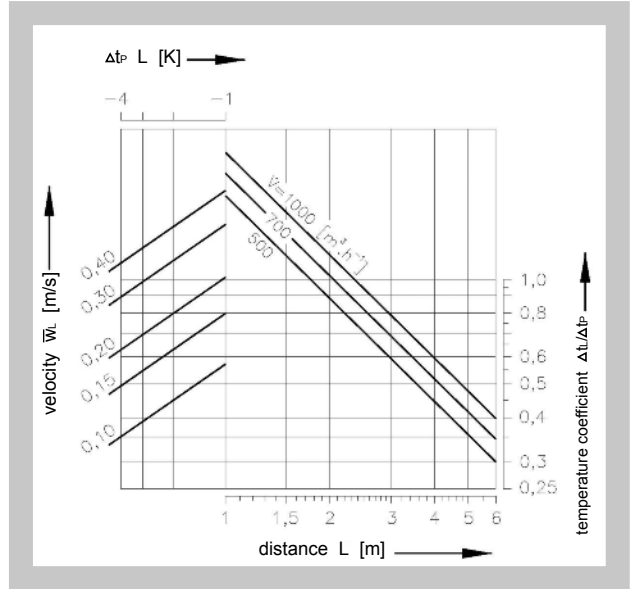


Chart 6.2.15. VPVM - R 1000

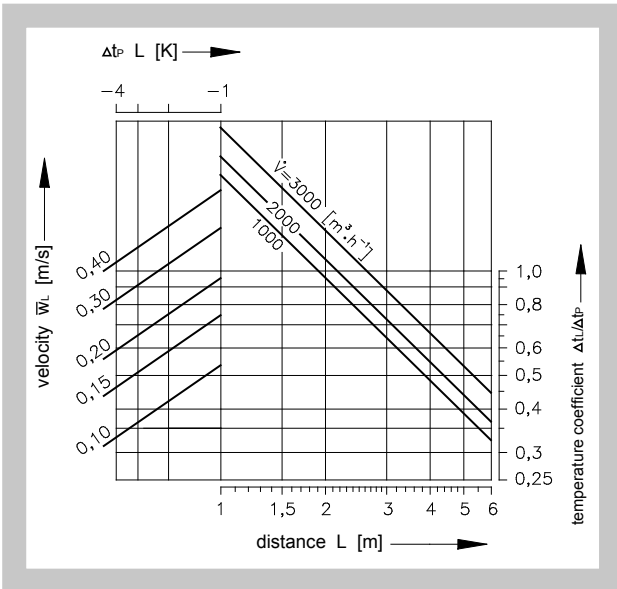


Chart 6.2.16. VPVM - R 1200

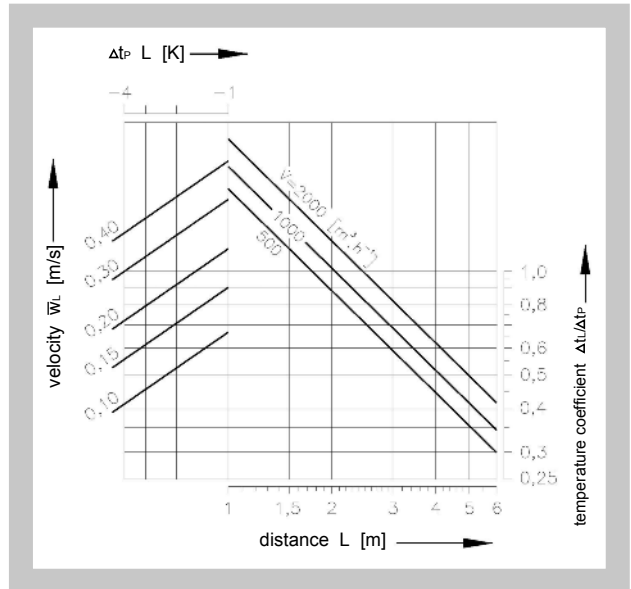


Chart 6.2.17. VPVM - R 1400

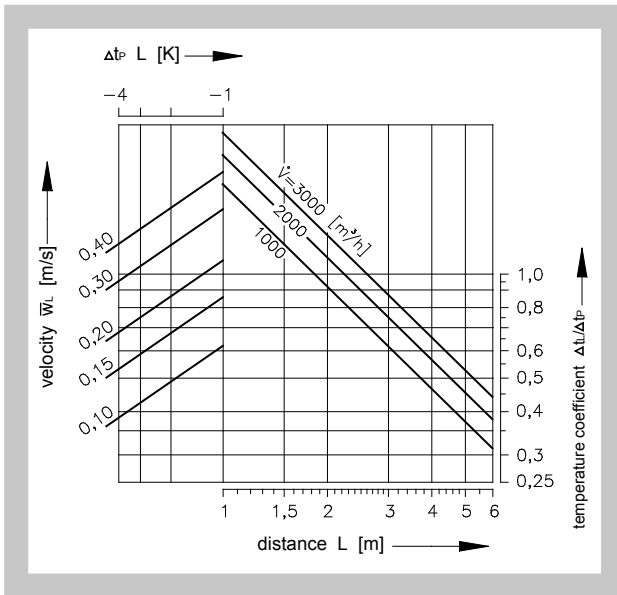


Chart 6.2.18. VPVM - R 1600

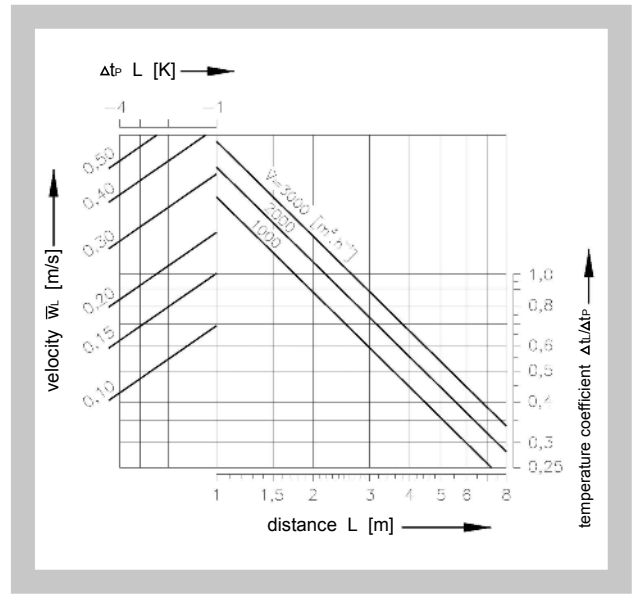


Chart 6.2.19. VPVM - R 2000

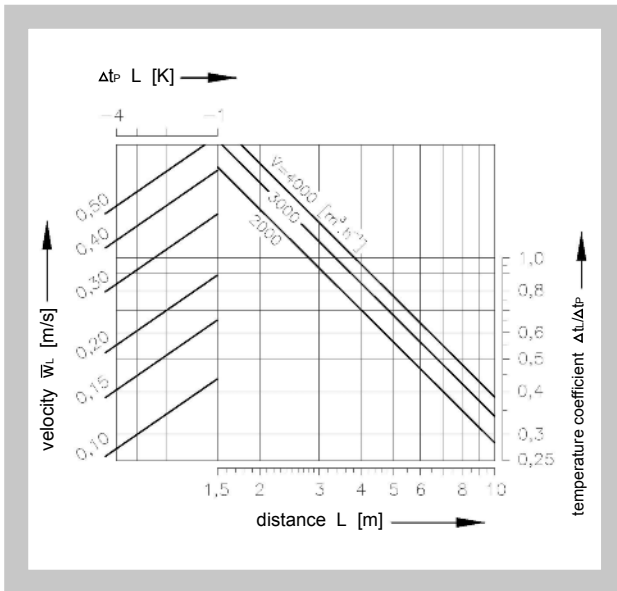


Fig. 6 Example

Data input: Vent VPVM - K
 $\dot{V} = 1400 \text{ m}^3 \cdot \text{h}^{-1}$
 $H = 1000 \text{ mm}$
 $\Delta t_p = -3 \text{ K}$
 $\bar{w}_L = 0,2 \text{ m} \cdot \text{s}^{-1}$

Preliminary design size 400
 Tab. 5.1.1.

Chart 6.1.1. : $\Delta p_c = 30 \text{ Pa}$
 $L_{WA} = 23 \text{ dB(A)}$

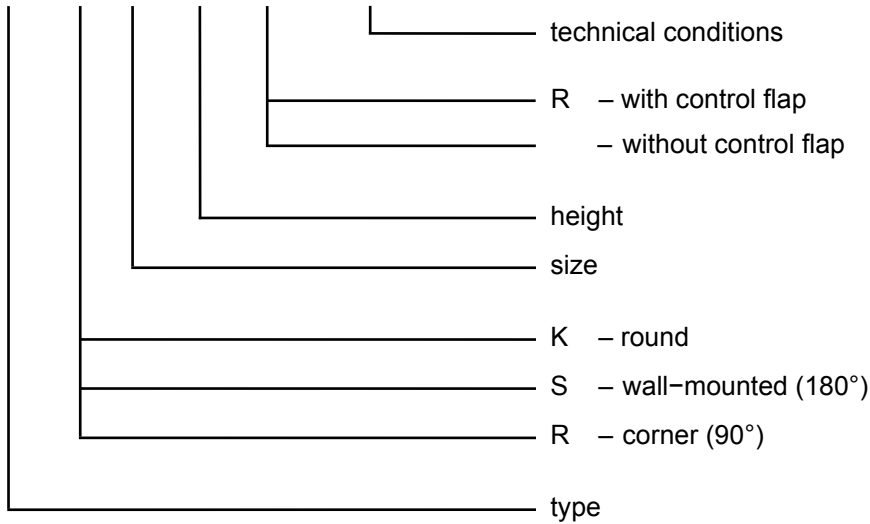
Chart 6.2.1. : $L = 2,7 \text{ m}$
 $\Delta t_l / \Delta t_p = 0,72$

Correction to outlet height $\Delta t_l / \Delta t_p = 0,5$

IV. ORDERING DATA

7. Ordering key

VPVM - K 400x1000 R TPM 013/01



V. MATERIAL, FINISHING

8. Material

- 8.1. Vent parts are made of steel sheet. The surface is finished with white baking varnish of RAL 9010 colour shade. Other shade requirements have to be agreed with the manufacturer in advance.

VI. PACKING, TRANSPORT, STORAGE

9. Logistical data

- 9.1. Vents are supplied in crates, covered with shrinkable foil, by covered transportation means. When handled during transport and storage, vents must be protected against mechanical damage.
- 9.2. Provided no method of acceptance is determined in the order, vents will be considered accepted when being handed over to the carrier.
- 9.3. Vents must be stored in covered rooms, in environments free from aggressive vapours, gases and dust. Temperature range of -5 to +40 °C and relative humidity up to 80% must be kept in the storage rooms.

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