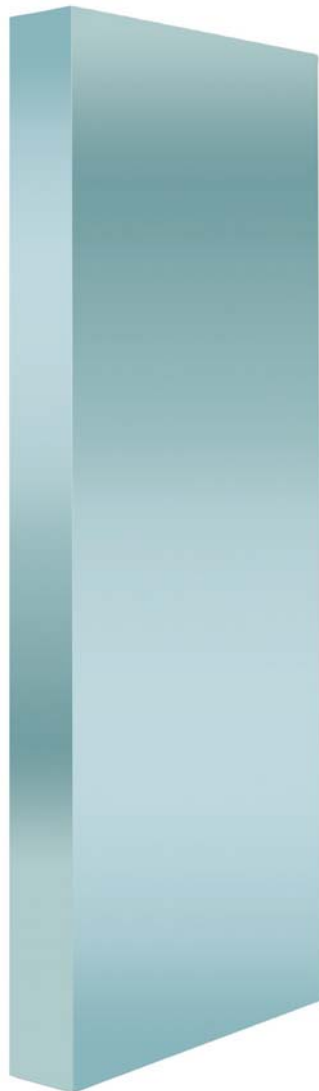




# Membrane absorber

## Type MAK / MAS



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## Membran-Absorber MAK / MAS

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## Membran-Absorber MAK / MAS

### Description

The membrane absorber is a **resonance absorber**. Acoustic and aerodynamic characteristic data in accordance with DIN 45646 (meets ISO / DIS 7235).

The membrane absorber **with completely smooth surface** is used for installations with extremely high hygienic requirements and in ventilation ducts with large amounts of dust and dirt or chemical stresses (e.g. ventilation and air-conditioning installations, large-scale catering, clean rooms, hospitals, etc.). **Easy cleaning** by washing or brushing. The membrane absorber shows a **good resistance to chemical and mechanical stresses** (i.e. in flow ducts subject to abrasive stress). Using the membrane absorber in RLT systems for kitchens, as requested in the VDI 2052, is possible without any problems.

The membrane absorber is supplied in a hygienic design to VDI 6022. The objective of the VDI 6022 "Hygienic planning, design, operation and maintenance of air-conditioning installations" is a hygienically impeccable interior air quality, i.e., avoidance of germination of the inhaled air. Accordingly, installation components must not emit any substances, fibres or odours hazardous to health, and must not promote the growth of microorganisms.

For maintenance, service, retrofitting, etc., inspection openings in sufficient number and size must be provided on site.

### Advantages

The silencing baffles made of membrane absorbers offer the following advantages: They

- selectively combat noise in dominant frequencies between 125 and 250 Hz.
- concentrate the silencers in a small area.
- improve their reaction to a fire in dusty media.
- save weight through lightweight construction.
- construct silencers as self-supporting components.
- guarantee a minimum flow resistance through completely smooth surfaces.
- meet the specifications according to DIN 1946, Part 4 for hospitals.

### Baffles

The baffles are hermetically sealed from the surroundings. Nothing but noise can enter the baffles made entirely of aluminium. Baffles are glued with Patex.

### Construction

Outside walls

- Aluminium perforated sheet membrane foil with cover membrane film (-AL).

Inner chambers

- Aluminium support plates in honeycomb design (-AL).

Duct

- 1.0 - 1.5 mm aluminium and Metu profile M3 (-AL).

### Model

MAK-... - Membrane absorber baffle, baffle thickness 100 mm

MAS-... - Silencer design, inner pressure to max. 1000 Pa, gap width 50 to 100 mm (membrane absorber baffle integrated into duct with connection flange, price on request).

Prices for models in stainless steel upon request

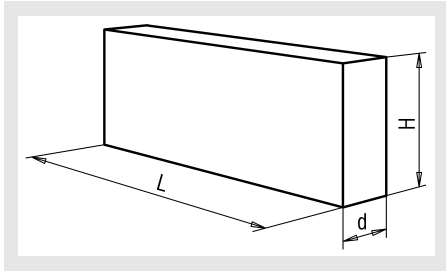
Other Metu profiles on request

## Membran-Absorber MAK / MAS

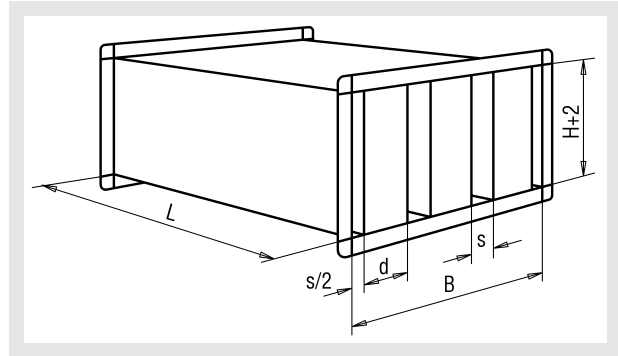
### Models and dimensions

#### Dimensions

##### MAK-...



##### MAS-...



#### Available sizes MAK-...

H	L	d
200	600	100
300	900	
400		
500	1200	
600	1500	
700		
800	1800	
900	2100	
1000		
1100	2400	
1200	2400	
1300		
1400	2700	
1500	3000	

All combined heights and lengths available.

#### Available sizes MAS-...

H	L	d	B
200	600	100	200
300			300
400	900		350
500	1200		400
600	1500		450
700			525
800	1800		600
900	2100		700
1000			750
1100	2400		800
1200	2400		875
1300			900
1400	2700		1000
1500	3000		1050
			1200
		1225	
		1400	
		1600	

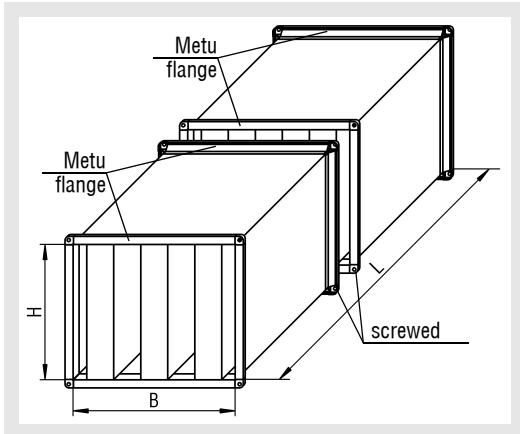
All combined heights, lengths and widths available.

## Membran-Absorber MAK / MAS

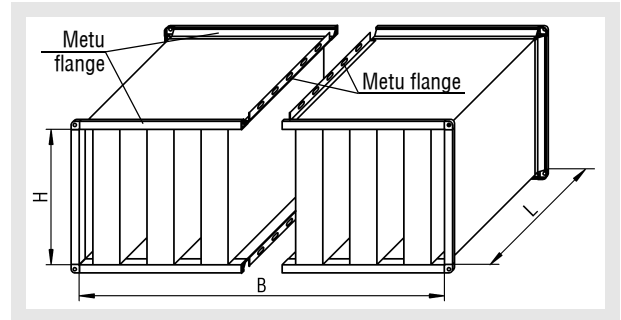
### Silencers in divided design

When using divided designs of silencer and baffles, a stable installation must be ensured on-site, since the components cannot have any load-bearing function.

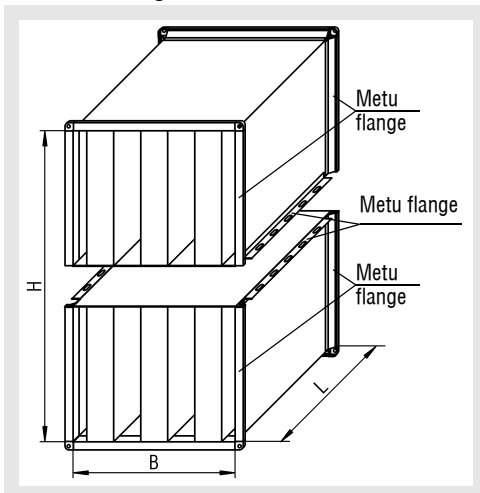
#### Divided length



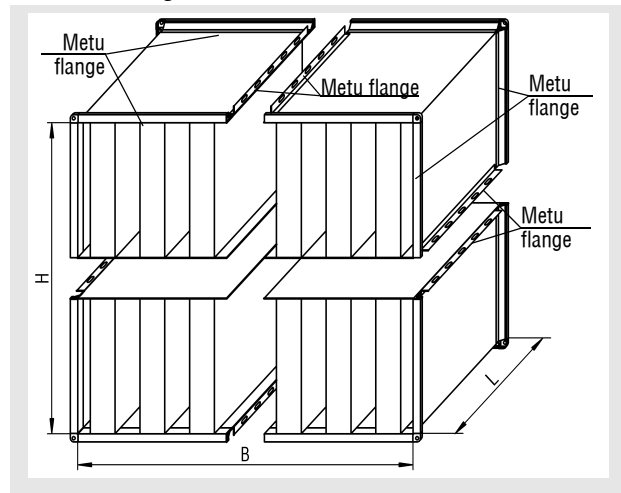
#### Sectioned width



#### Sectioned height



#### Width and height divided

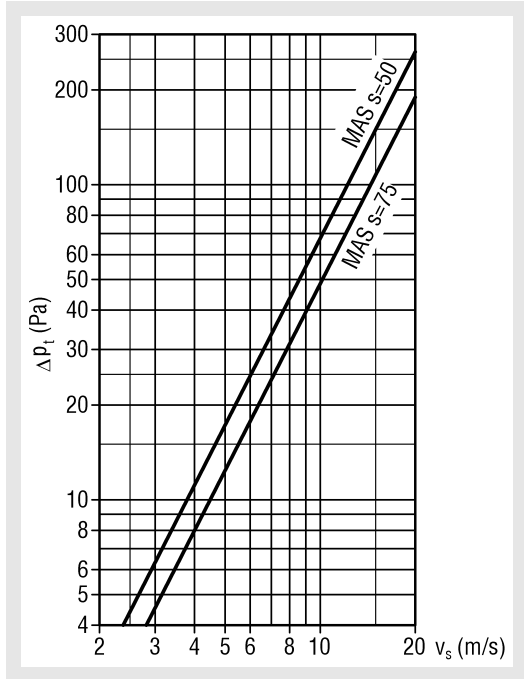


# Membran-Absorber MAK / MAS

## Technical data

### Pressure loss and noise level

to DIN 45 646 (ISO / DIS 7235)



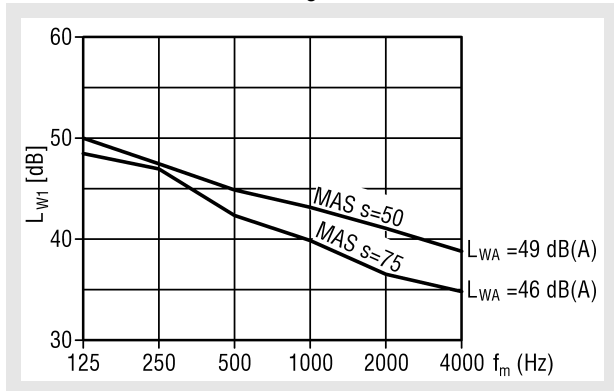
### Length correction factor

L (mm)	600	900	1200	1500	1800	2100	2400	2700	3000
$\Delta p_t$ (Pa)	x0.91	x1.00	x1.18	x1.26	x1.34	x1.42	x1.50	x1.58	x1.66

### Flow generated noise

to DIN 45 646 (ISO / DIS 7235)

relative to a gap velocity of  $v_s = 10$  m/s



The sound power level  $L_{W1}$ , relative to  $1 \text{ m}^2$  of inflow area.

### Correction factor for other flow areas

? A (m <sup>2</sup> )	0,05	0,10	0,20	0,30	0,50	0,80	1,00	1,50	2,00	2,50
KF (-)	-13	-10	-7	-5	-3	-1	0	2	3	4

$$L_W = L_{W1} + KF$$

## Insertion loss

Octave centre frequency (Hz) to DIN 45 646 (ISO / DIS 7235)

MAS s=50

L (mm)	$f_m$ (Hz)							
	63	125	250	500	1000	2000	4000	8000
600	1,7	4,1	17,3	13,0	7,1	5,7	6,1	6,7
900	2,1	7,4	16,7	15,3	8,1	6,4	6,7	7,4
1200	2,1	9,4	22,0	19,3	10,4	7,4	7,7	8,1
1500	2,7	12,4	27,0	20,7	12,0	8,1	8,1	8,4
1800	3,4	14,3	30,9	27,6	13,4	9,0	9,0	9,4
2100	3,8	15,1	34,8	31,1	16,7	12,4	13,0	14,0
2400	3,8	16,9	39,6	34,7	18,7	13,3	13,9	14,6
2700	4,3	19,6	44,1	36,0	20,2	14,0	14,2	14,9
3000	4,9	22,3	48,6	37,3	21,6	14,6	14,6	15,1

$D_e$  [dB/Oct]

MAS s=75

L (mm)	$f_m$ (Hz)							
	63	125	250	500	1000	2000	4000	8000
600	1,4	3,1	12,7	9,0	4,4	5,1	5,4	4,7
900	1,4	5,4	14,0	11,4	5,1	5,4	6,1	5,4
1200	1,4	7,1	18,0	12,4	6,7	6,1	6,4	5,7
1500	2,1	9,4	24,7	15,3	8,1	6,7	7,1	6,1
1800	2,1	10,7	25,3	18,0	9,4	7,1	7,4	6,4
2100	2,5	11,3	28,8	21,4	10,6	10,4	11,3	10,0
2400	2,5	12,8	32,4	22,3	12,1	11,0	11,5	10,3
2700	3,2	14,9	38,4	24,9	13,3	11,5	12,2	10,6
3000	3,8	16,9	44,5	27,5	14,6	12,1	12,8	11,0

$D_e$  [dB/Oct]

MAS s=100

L (mm)	$f_m$ (Hz)							
	63	125	250	500	1000	2000	4000	8000
600	1,1	2,1	8,1	5,0	1,7	4,5	4,7	2,7
900	0,7	3,4	11,3	7,5	2,1	4,4	5,5	3,4
1200	0,7	4,8	14,0	5,5	3,0	4,8	5,1	3,3
1500	1,5	6,4	22,4	9,9	4,2	5,3	6,1	3,8
1800	0,8	7,1	19,7	8,4	5,4	5,2	5,8	3,4
2100	1,3	7,4	22,8	9,9	4,6	8,3	9,5	6,0
2400	1,3	8,6	25,2	11,7	5,4	8,6	9,2	5,9
2700	2,0	10,1	32,8	13,9	6,5	9,1	10,1	6,4
3000	2,7	11,5	40,3	17,8	7,6	9,5	11,0	6,8

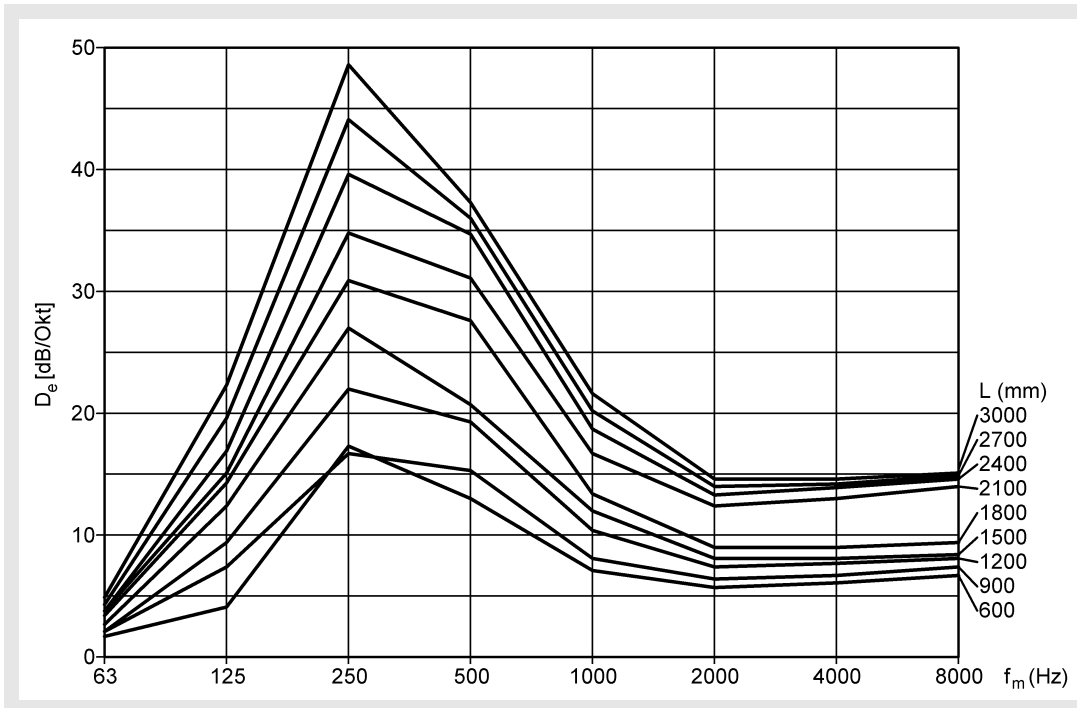
$D_e$  [dB/Oct]

## Membran-Absorber MAK / MAS

### Insertion loss

Octave centre frequency (Hz) to DIN 45 646 (ISO / DIS 7235)

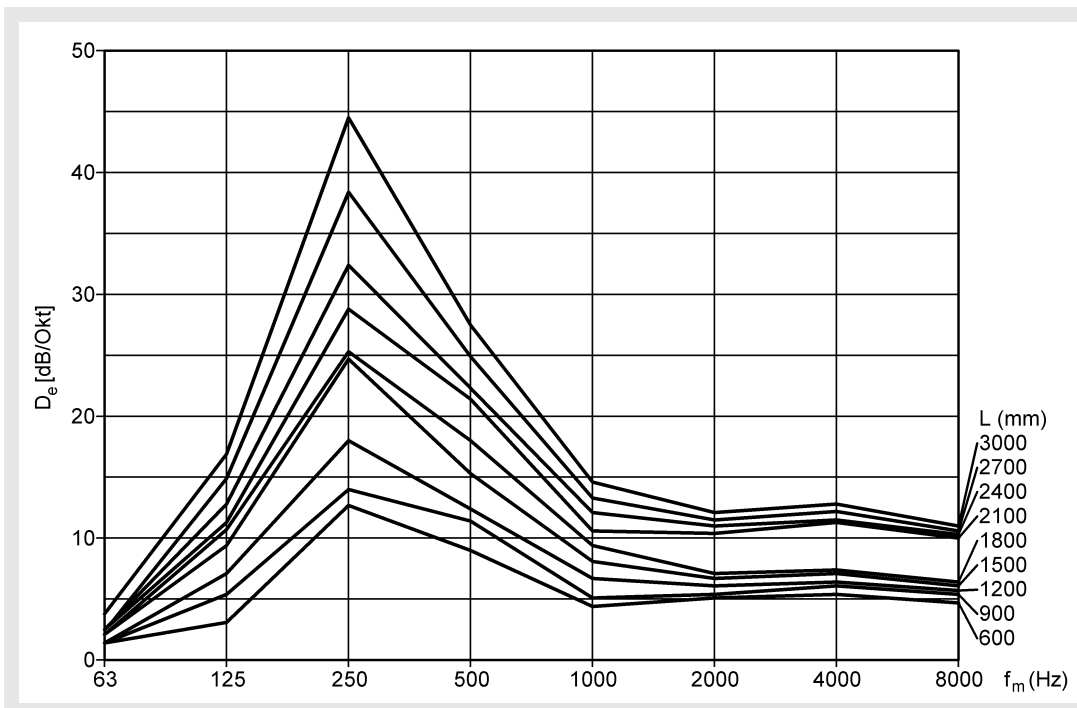
**MAS s=50**



### Insertion loss

Octave centre frequency (Hz) to DIN 45 646 (ISO / DIS 7235)

**MAS s=75**

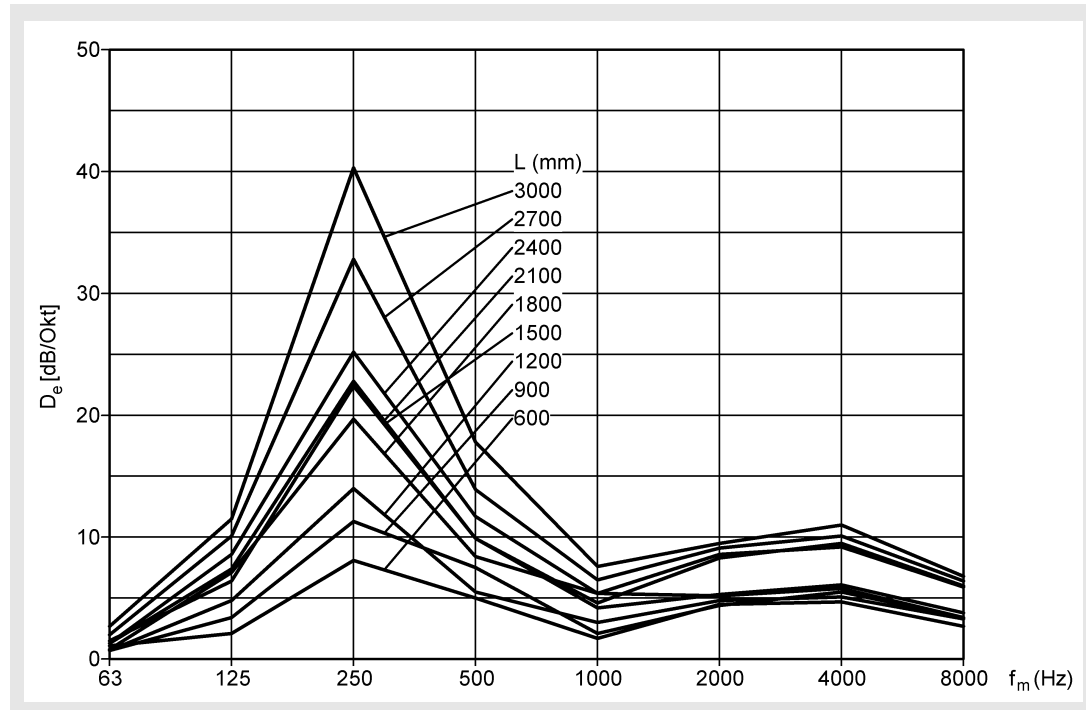


## Membran-Absorber MAK / MAS

### Insertion loss

Octave centre frequency (Hz) to DIN 45 646 (ISO / DIS 7235)

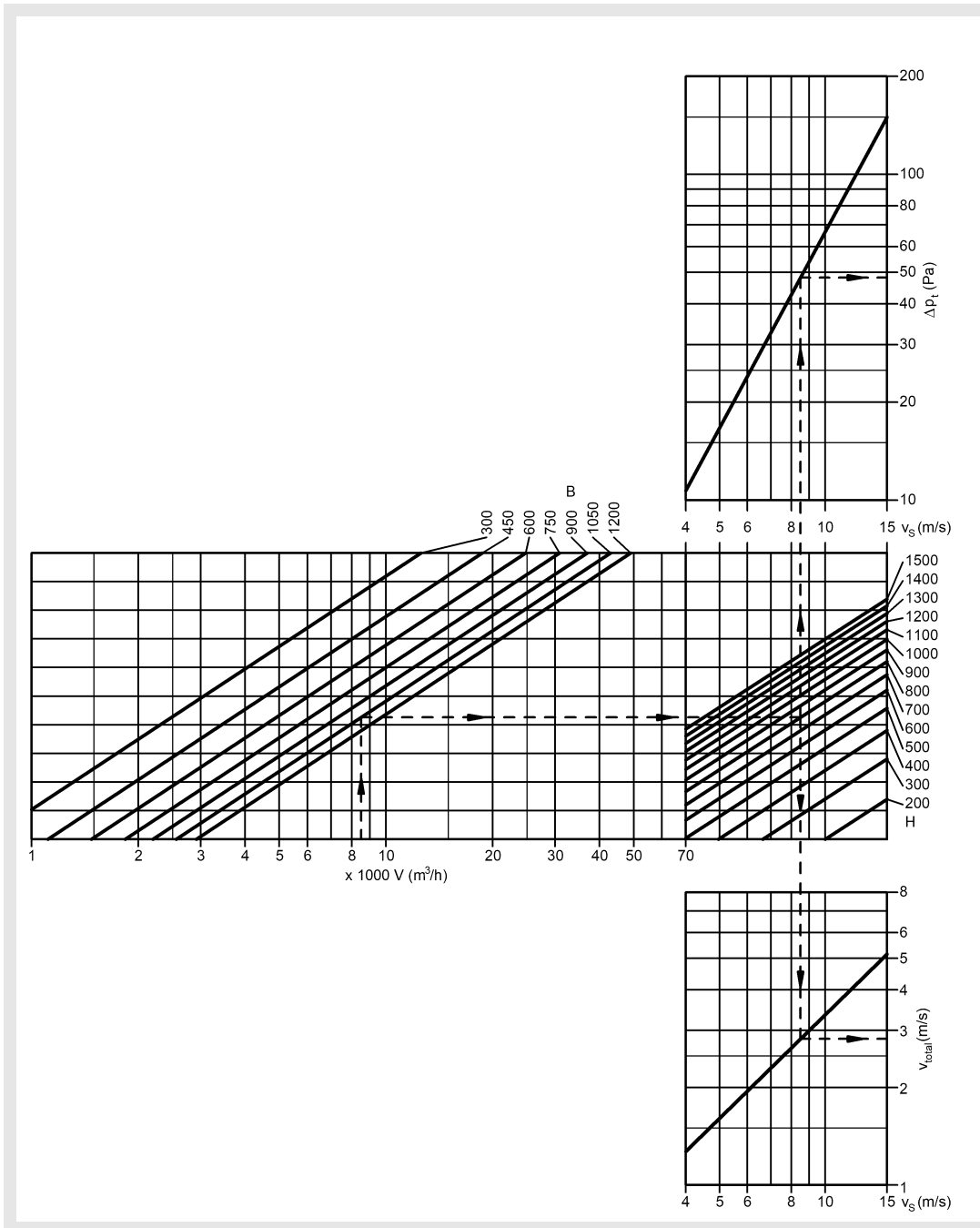
MAS s=100





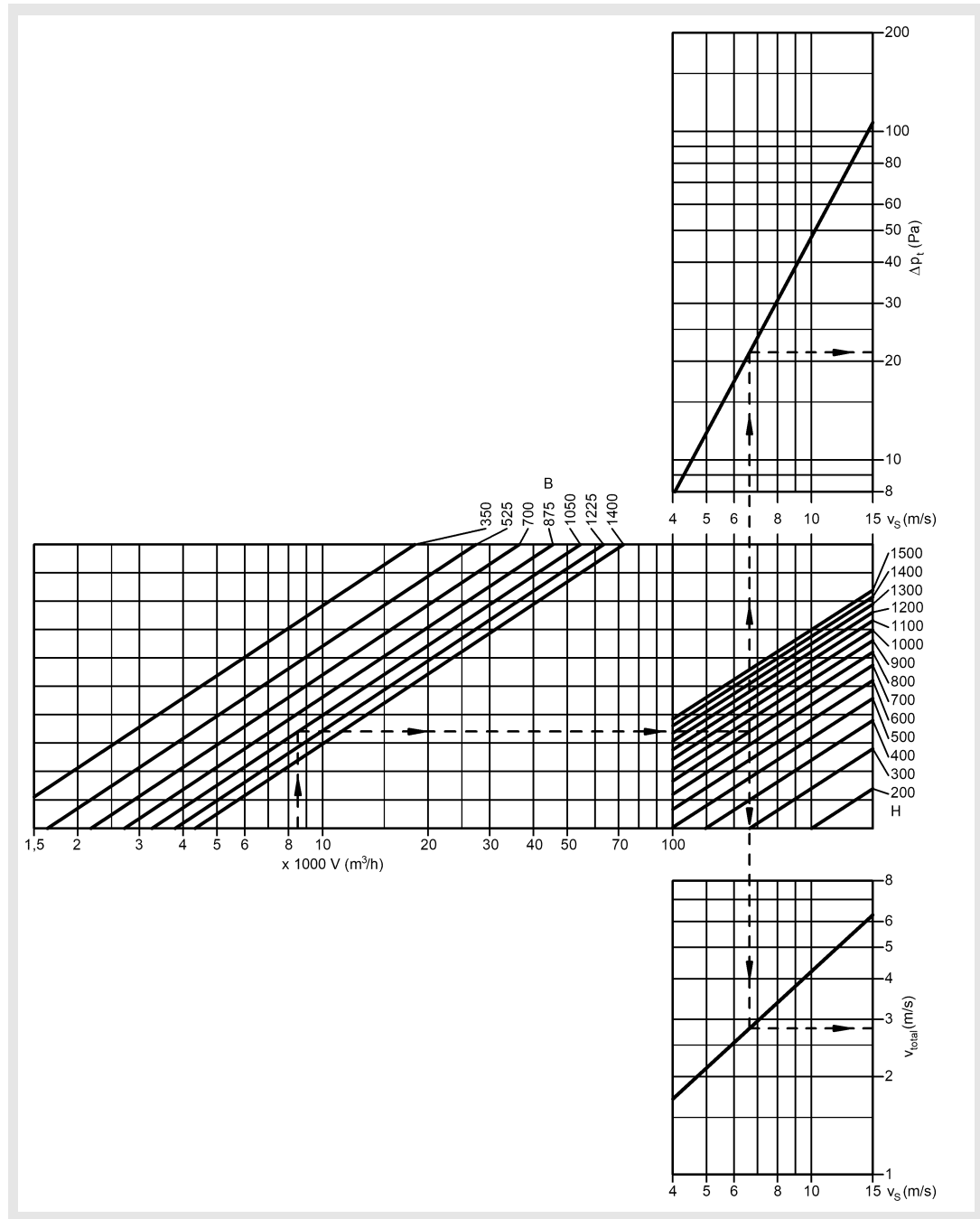
## Membran-Absorber MAK / MAS

Selection diagram  
MAS s=50



## Membran-Absorber MAK / MAS

Selection diagram  
MAS s=75



## Membran-Absorber MAK / MAS

### Quick selection

#### MAS s=50

relative to a gap velocity of  $v_S = 10$  m/s

B (mm)	300	450	600	750	900	1050	1200	
n	2	3	4	5	6	7	8	
H (mm)	200	720	1080	1440	1800	2160	2520	2880
	300	1080	1620	2160	2700	3240	3780	4320
	400	1440	2160	2880	3600	4320	5040	5760
	500	1800	2700	3600	4500	5400	6300	7200
	600	2160	3240	4320	5400	6480	7560	8640
	700	2520	3780	5040	6300	7560	8820	10080
	800	2880	4320	5760	7200	8640	10080	11520
	900	3240	4860	6480	8100	9720	11340	12960
	1000	3600	5400	7200	9000	10800	12600	14400
	1100	3960	5940	7920	9900	11880	13860	15840
	1200	4320	6480	8640	10800	12960	15120	17280
	1300	4680	7020	9360	11700	14040	16380	18720
	1400	5040	7560	10080	12600	15120	17640	20160
	1500	5400	8100	10800	13500	16200	18900	21600
	<b>V (m<sup>3</sup>/h)</b>							

#### MAS s=75

relative to a gap velocity of  $v_S = 10$  m/s

B (mm)	350	525	700	875	1050	1225	1400	
n	2	3	4	5	6	7	8	
H (mm)	200	1082	1622	2163	2704	3245	3785	4326
	300	1622	2433	3245	4056	4867	5678	6489
	400	2163	3245	4326	5408	6489	7571	8652
	500	2704	4056	5408	6759	8111	9463	10815
	600	3245	4867	6489	8111	9734	11356	12978
	700	3785	5678	7571	9463	11356	13248	15141
	800	4326	6489	8652	10815	12978	15141	17304
	900	4867	7300	9734	12167	14600	17034	19467
	1000	5408	8111	10815	12519	16223	18926	21630
	1100	5948	8922	11897	14871	17845	20819	23793
	1200	6489	9734	12978	16223	19467	22712	25956
	1300	7030	10545	14060	17574	21089	24604	28119
	1400	7571	11356	15141	18926	22712	26497	30282
	1500	8111	12167	16223	20278	24334	28289	32445
	<b>V (m<sup>3</sup>/h)</b>							

## Membran-Absorber MAK / MAS

### Legend

$V_{ZU}$	(m <sup>3</sup> /h)	= Supply air volume
$V_{ZU}$	[l/s]	= Supply air volume
$v_S$	(m/s)	= Gap velocity
$v_{total}$	(m/s)	= Velocity in the inflow area (B x H)
$f_m$	(Hz)	= Octave centre frequency
$L_W$	[dB]	= sound power level
$L_{W1}$	[dB]	= Sound power level, relative to 1 m <sup>2</sup> of inflow area.
$L_{WA1}$	[dB(A)]	= A-weighted sound power level
$D_e$	(dB/oct)	= Insertion loss
$\Delta p_t$	(Pa)	= Pressure loss
KF	(-)	= Correction factor
n	(-)	= Number of baffles
A	(m <sup>2</sup> )	= Inflow area
B	(mm)	= Width
H	(mm)	= Height
L	(mm)	= Length
s	(mm)	= Gap width

## Membran-Absorber MAK / MAS

### Order details MAK

01	02	03	04	05
Type	Height	Length	Baffle thickness	Material
<b>Example</b>				
MAK-	-1500	-3000	-100	-AL

#### Sample

**MAK-1500-3000-100-AL**

Membrane absorber baffle | Height 1500 mm | Length 3000 mm | Baffle thickness 100 mm | Aluminium

#### Order details

##### 01 - Type

MAK = Membrane absorber baffle

##### 02 - Height

xxxx = freely selectable (always in with 4 digits in mm),  
min. 0200 mm, max 1500 mm

##### 03 - Length

xxxx = freely selectable (always in with 4 digits in mm), min.  
0600 mm, max. 3000 mm

##### 04 - Baffle thickness

100 = 100 mm

##### 05 - Material

AL = Aluminium (standard)

## Membran-Absorber MAK / MAS

### Order details MAS

01	02	03	04	05	06	07	08
Type	Width	Height	Length	Baffle thickness	Number of baffles	Material	Profiled connection frame
<b>Example</b>							
MAS-	-0250	-1500	-1200	-100	-1	-AL	-M3

#### Sample

**MAS-0250-1500-1200-100-1-AL-M3**

Membrane absorber silencer | width 250 mm | height 1500 mm | length 1200 mm | baffle thickness 100 mm | number of baffles 1 | aluminium | with Metu profile M3

#### Order details

##### 01 - Type

MAS = Membrane absorber silencer

##### 02 - Width

xxxx = freely selectable (always in with 4 digits in mm), min.  
0150 mm, max 1600 mm

##### 03 - Height

xxxx = freely selectable (always in with 4 digits in mm), min.  
0200 mm, max 1500 mm

##### 04 - Length

xxxx = freely selectable (always in with 4 digits in mm), min.  
0600 mm, max 3000 mm

##### 05 - Baffle thickness

100 = 100 mm

##### 06 - Number of baffles

- 1 = 1 baffle
- 2 = 2 baffles
- 3 = 3 baffles
- 4 = 4 baffles
- 5 = 5 baffles
- 6 = 6 baffles
- 7 = 7 baffles
- 8 = 8 baffles

##### 07 - Material

AL = Aluminium (standard)

##### 08 - Profile connection frame

M3 = Metu profile M3 (standard)

## Membran-Absorber MAK / MAS

### Specification texts

Membrane absorber in baffle design with completely smooth surface for use in installations with extremely high hygienic requirements to VDI 6022, VDI 2052 or in ventilation ducts with large amounts of dust or dirt or chemical stresses. Honeycomb inner-chamber made of aluminium carrier plates. Outside walls made of aluminium perforated sheet membrane foil with cover membrane foil. Baffle thickness 100 mm (-100).

Product: SCHAKO **type MAK-...**

- Material
  - Aluminium (-AL) (standard)

Membrane absorber in silencer design with completely smooth surface for use in installations with extremely high hygienic requirements to VDI 6022, VDI 2052 or in ventilation ducts with large amounts of dust or dirt or chemical stresses. Inner chambers in honeycomb design made of aluminium support plates. Outside walls made of aluminium perforated sheet membrane foil with cover membrane foil. Baffle thickness 100 mm (-100). Ducts made of aluminium with saddle joints and connecting flanges Metu profile M3.

Product: SCHAKO **type MAS-...**

- Material
  - Aluminium (-AL) (standard)