

DSA and DF-CP-MT Floor swirl diffusers

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Circular floor swirl diffuser DSA

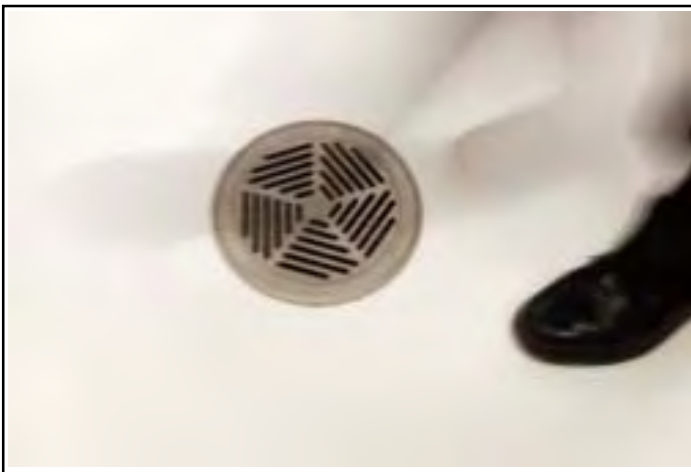


DESCRIPTION

Circular diffuser with swirl air supply, suitable for false floor installation. Diffuser slots are designed to ensure a swirl air supply with high levels of induction, achieving reduced air velocities and a moderate temperature gradient in the occupied zone. The diffuser may be used in rooms with a variable or constant air volume.

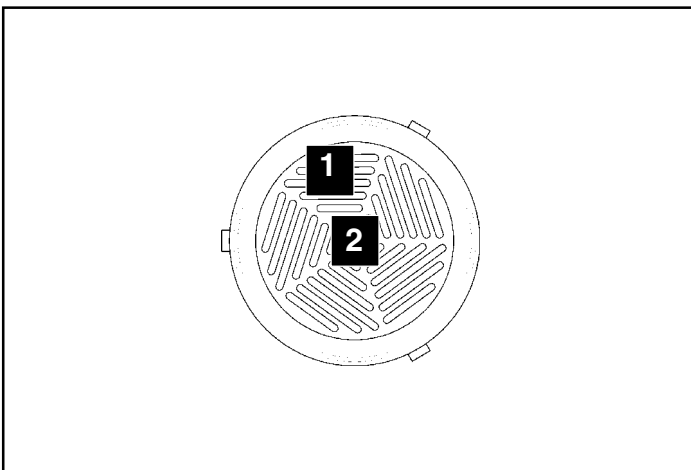
PRODUCT CHARACTERISTICS

- Manufactured in aluminium (DSA)
- Manufactured in sheet steel (DSA-K)
- Sheet steel drip trap and swirl unit
- High levels of induction
- Simple to clean
- Can be used with connection plenum



TYPES

- DSA:** Standard footwear
DSA-K: High point load shoes



DIFFUSER LOAD CAPACITY

Model	Size	Position 1	Position 2
DSA	Ø150	1,75	2
	Ø200	1	1
DSA-K	Ø150	2,9	2,5
	Ø200	2	2,25

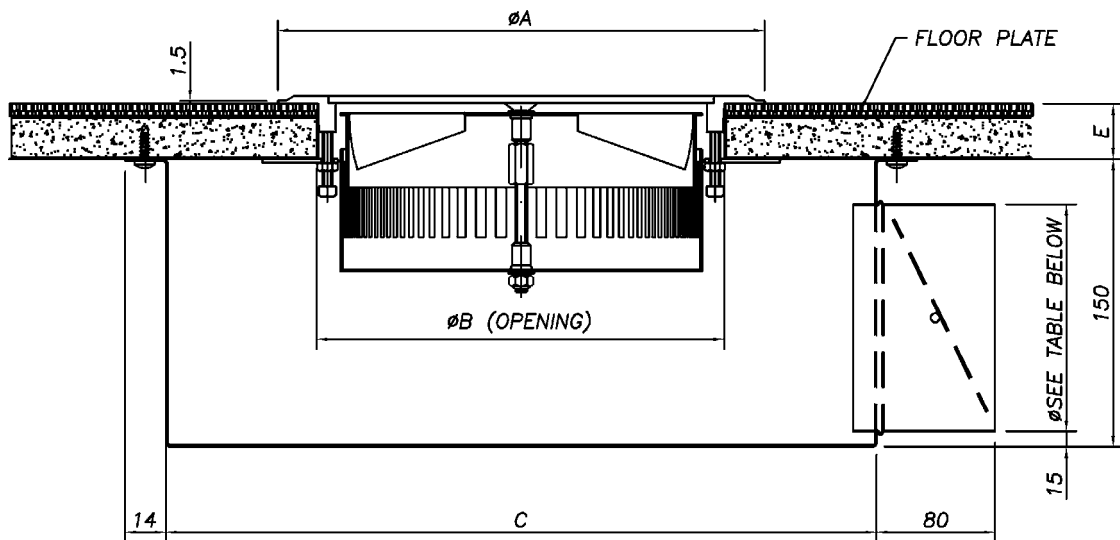
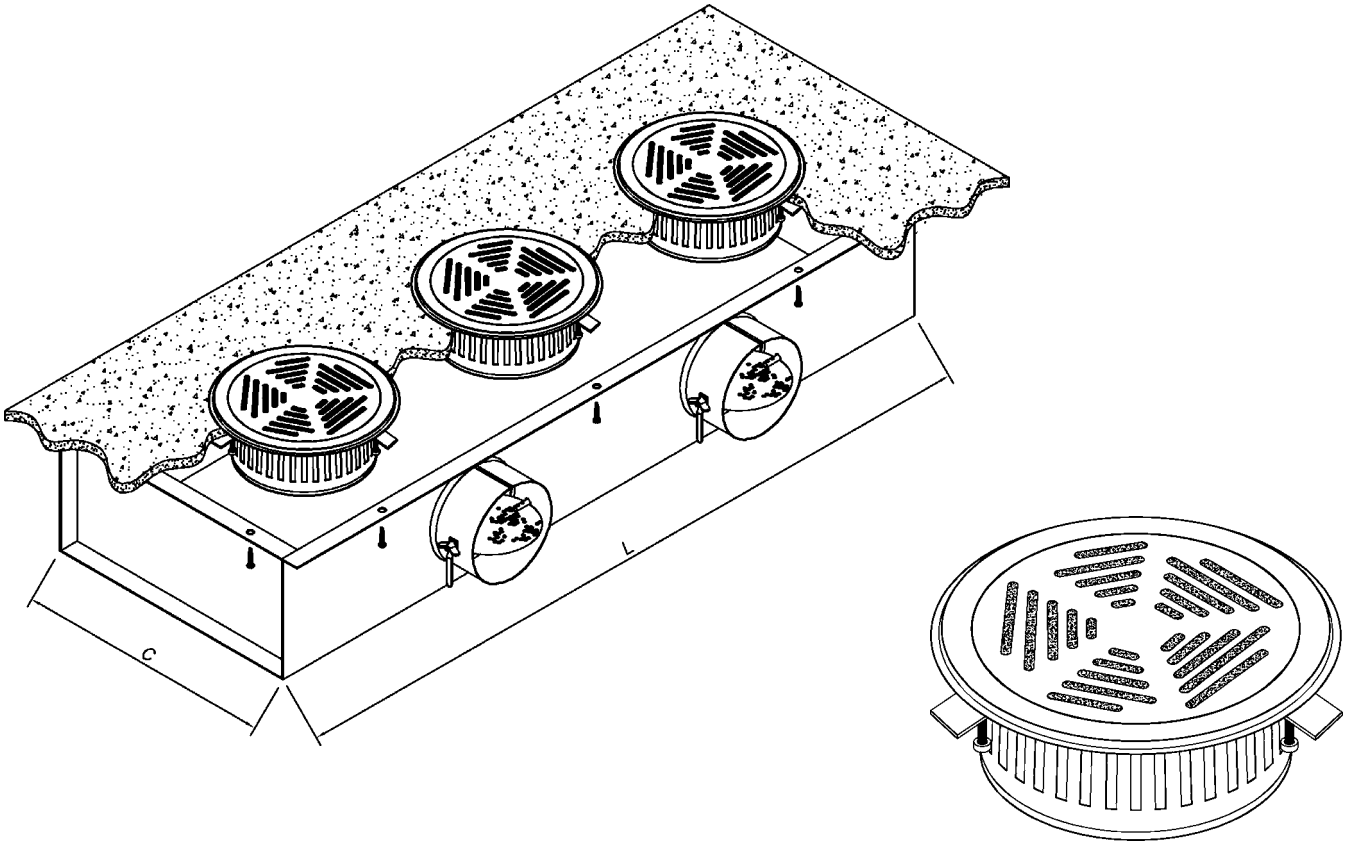
Load in kN

According to the requirements of European test standard EN 13264:2001, over 30 x 30 mm² area



FLOOR Series

Models and dimensions. DSA diffuser



Model	Ø A	Ø B	C	L				E	
				1 DIFFUSER	2 DIFFUSERS	3 DIFFUSERS	4 DIFFUSERS	MAXIMUM	MINIMUM
150	190	150	225	500	1000	1500	2000	32	14
200	240	200	275	1 SPIGOT Ø100	2 SPIGOTS Ø100	2 SPIGOTS Ø125	2 SPIGOTS Ø125		

Technical data. Selection table. DSA diffuser

Technical data in regard to sound power and pressure drop refer to a DSA diffuser without plenum

Circular floor swirl diffuser DSA								
Q		Size	150			200		
		A _k (m ²)	0,00495			0,00945		
(m ³ /h)	(l/s)	ΔT (°C)	-4	-6	-8	-4	-6	-8
30	8,3	h _{0,25} (m)	0,8	0,7	0,6			
		V _k (m/s)		1,7				
		ΔP _{est} (Pa)		6				
		L _w - [dB(A)]		< 20				
35	9,7	h _{0,25} (m)	0,9	0,8	0,7			
		V _k (m/s)		2,0				
		ΔP _{est} (Pa)		8				
		L _w - [dB(A)]		22				
40	11,1	h _{0,25} (m)	1,1	0,9	0,8			
		V _k (m/s)		2,2				
		ΔP _{est} (Pa)		11				
		L _w - [dB(A)]		25				
45	12,5	h _{0,25} (m)	1,2	1,0	0,9			
		V _k (m/s)		2,5				
		ΔP _{est} (Pa)		13				
		L _w - [dB(A)]		28				
50	13,9	h _{0,25} (m)	1,3	1,2	1,0	0,7	0,6	0,5
		V _k (m/s)		2,8			1,5	
		ΔP _{est} (Pa)		17			3	
		L _w - [dB(A)]		31			< 20	
60	16,7	h _{0,25} (m)	1,6	1,4	1,2	0,8	0,7	0,6
		V _k (m/s)		3,4			1,8	
		ΔP _{est} (Pa)		24			5	
		L _w - [dB(A)]		35			20	
70	19,4	h _{0,25} (m)	1,9	1,6	1,4	0,9	0,8	0,7
		V _k (m/s)		3,9			2,1	
		ΔP _{est} (Pa)		33			7	
		L _w - [dB(A)]		39			24	

Q (m³/h)	Air flow rate
A_k (m²)	Effective supply area
ΔT (°C)	Temperature ΔT
h_{0,25} (m)	Vertical throw for an air velocity of 0,25 m/s
V_k (m/s)	Effective supply velocity
ΔP_{est} (Pa)	Pressure drop
L_w [dB(A)]	Sound power

Technical data. Selection table. DSA diffuser

Technical data in regard to sound power and pressure drop refer to a DSA diffuser without plenum

Circular floor swirl diffuser DSA								
Q		Size	150			200		
		A _k (m ²)	0,00495			0,00945		
(m ³ /h)	(l/s)	ΔT (°C)	-4	-6	-8	-4	-6	-8
85	23,6	h _{0,25} (m)	2,3	2,0	1,7	1,1	1,0	0,9
		V _k (m/s)		4,8			2,5	
		ΔP _{est} (Pa)		48			10	
		L _w - [dB(A)]		43			29	
100	27,8	h _{0,25} (m)	2,7	2,3	2,0	1,3	1,2	1,0
		V _k (m/s)		5,6			2,9	
		ΔP _{est} (Pa)		67			14	
		L _w - [dB(A)]		47			33	
115	31,9	h _{0,25} (m)				1,5	1,3	1,2
		V _k (m/s)					3,4	
		ΔP _{est} (Pa)					18	
		L _w - [dB(A)]					36	
130	36,1	h _{0,25} (m)				1,7	1,5	1,3
		V _k (m/s)					3,8	
		ΔP _{est} (Pa)					23	
		L _w - [dB(A)]					39	
150	41,7	h _{0,25} (m)				2,0	1,7	1,5
		V _k (m/s)					4,4	
		ΔP _{est} (Pa)					31	
		L _w - [dB(A)]					43	
170	47,2	h _{0,25} (m)				2,3	2,0	1,7
		V _k (m/s)					5,0	
		ΔP _{est} (Pa)					40	
		L _w - [dB(A)]					46	

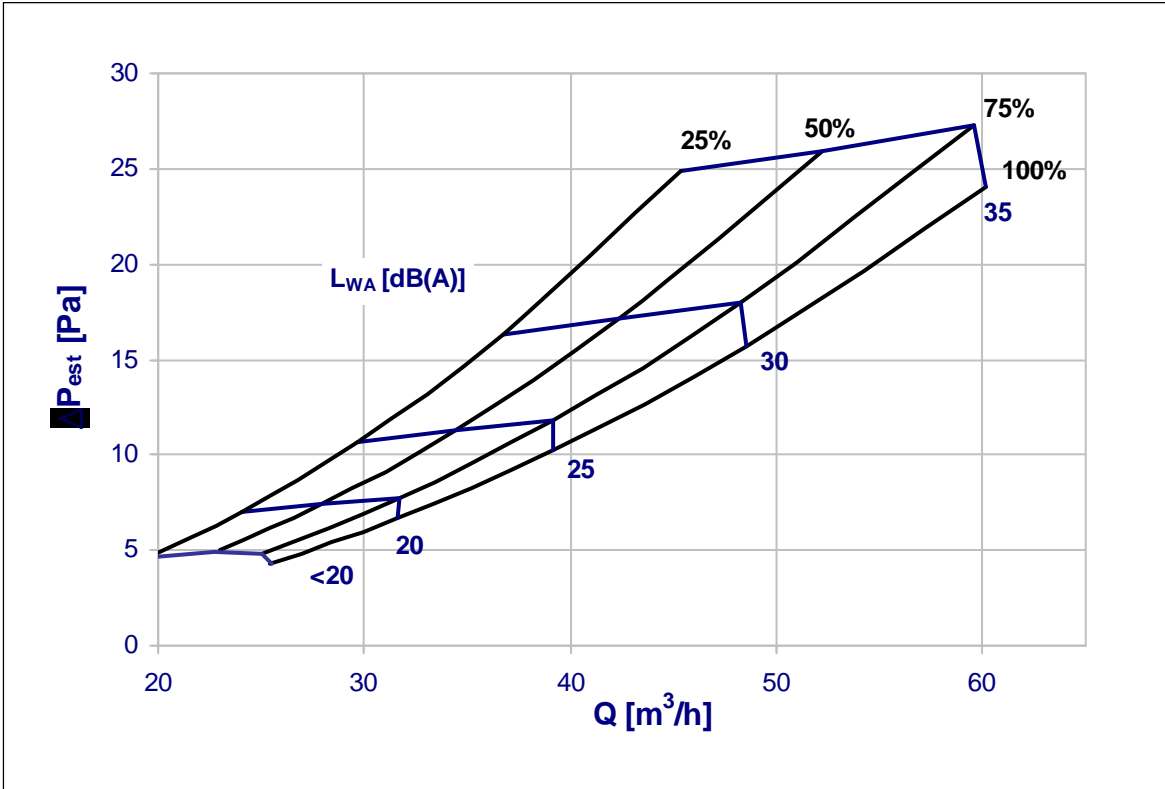
- Q (m³/h)** Air flow rate
- A_k (m²)** Effective supply area
- ΔT (°C)** Temperature ΔT
- h_{0,25} (m)** Vertical throw for an air velocity of 0,25 m/s
- V_k (m/s)** Effective supply velocity
- ΔP_{est} (Pa)** Pressure drop
- L_w [dB(A)]** Sound power

Technical data. Selection graphs. DSA diffuser

Sound power
% (Drip trap opening percentage)

DSA 150 WITHOUT PLENUM

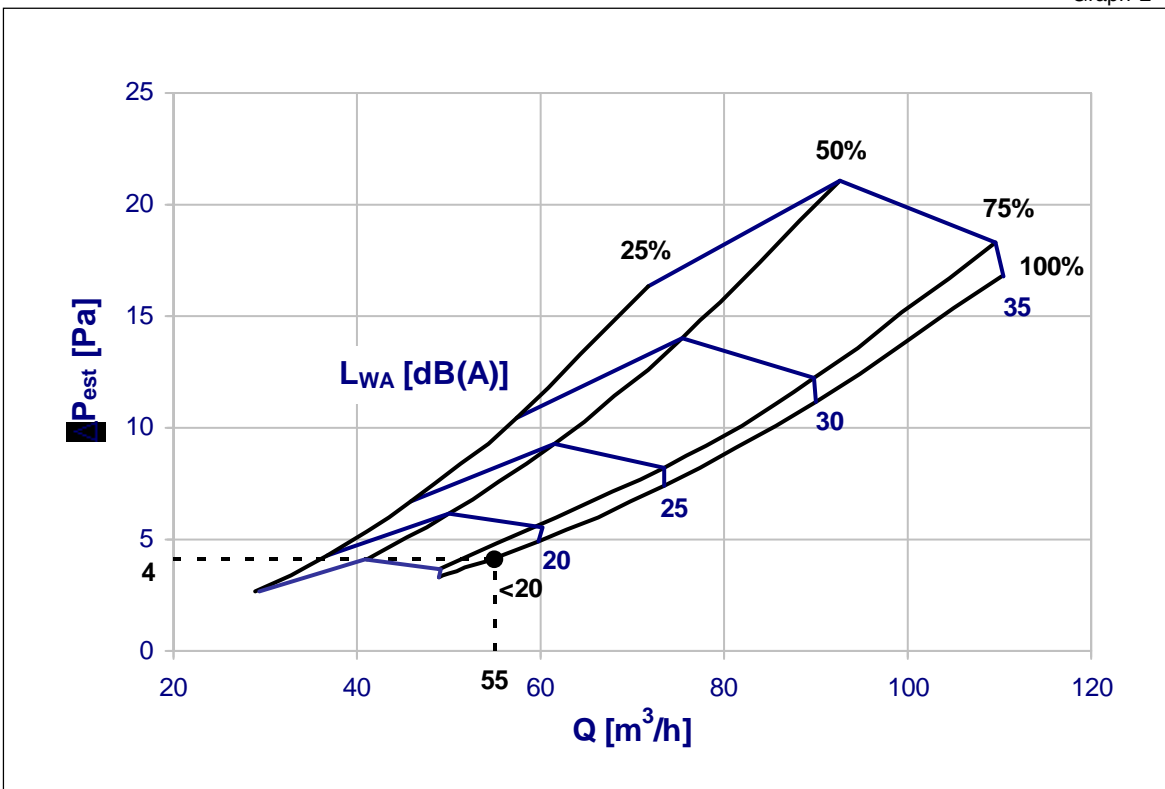
Graph 1



Sound power
% (Drip trap opening percentage)

DSA 200 WITHOUT PLENUM

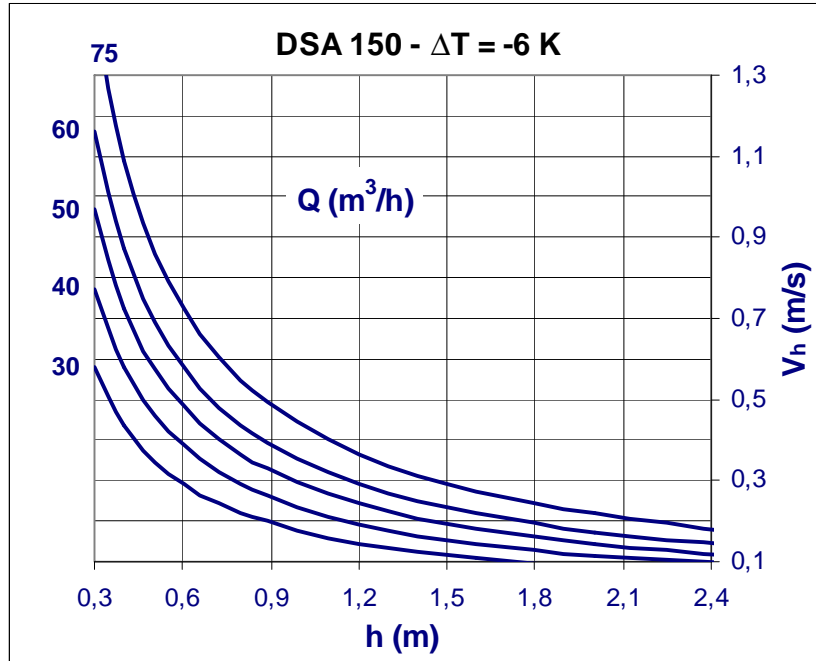
Graph 2



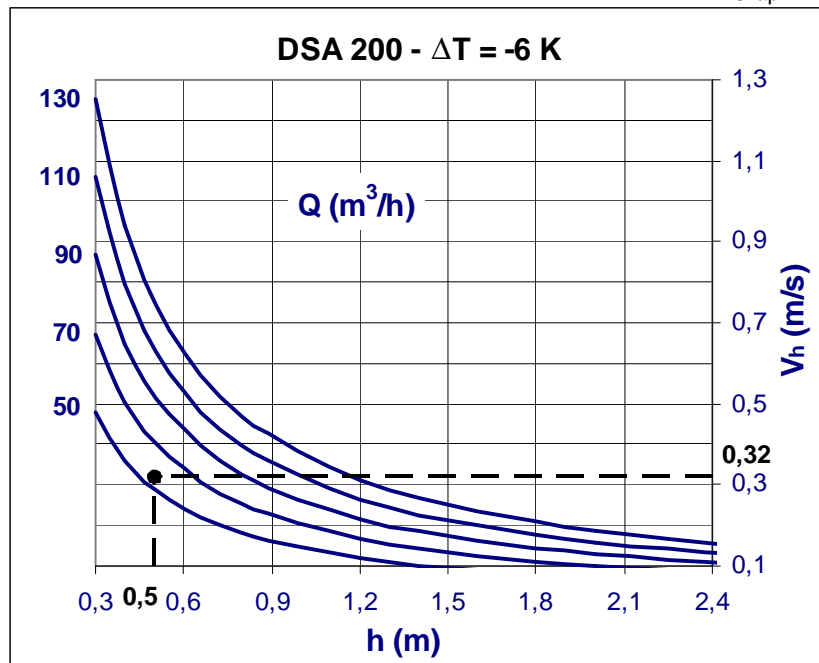
Technical data. Selection graphs. DSA diffuser

Graphs showing the duct air velocity at different heights account for a possible difference between supply air temperature and room temperature of - 6 K; for a different differential, we must apply the coefficients shown in the table below, using the corresponding formula.

Graph 3



Graph 4



Coefficient correction table

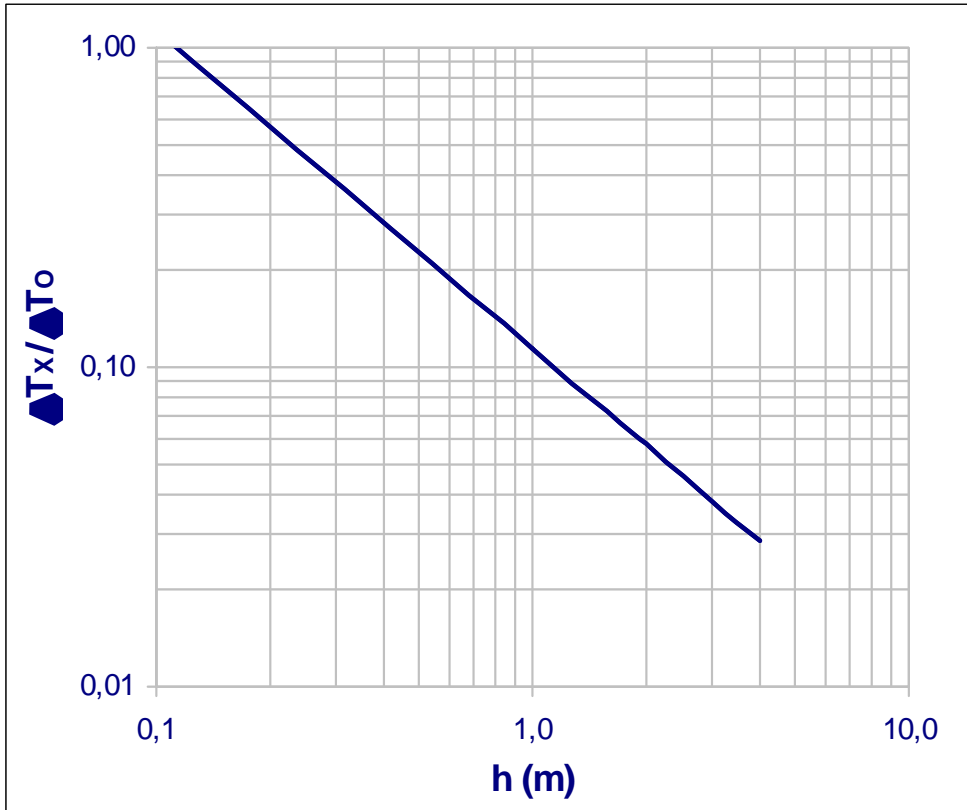
ΔT (K)	-4	-6	-8	-10
C	1,15	1	0,87	0,76

$$V_h = V_{h_graph} \times C$$

Technical data. Selection graphs. DSA diffuser

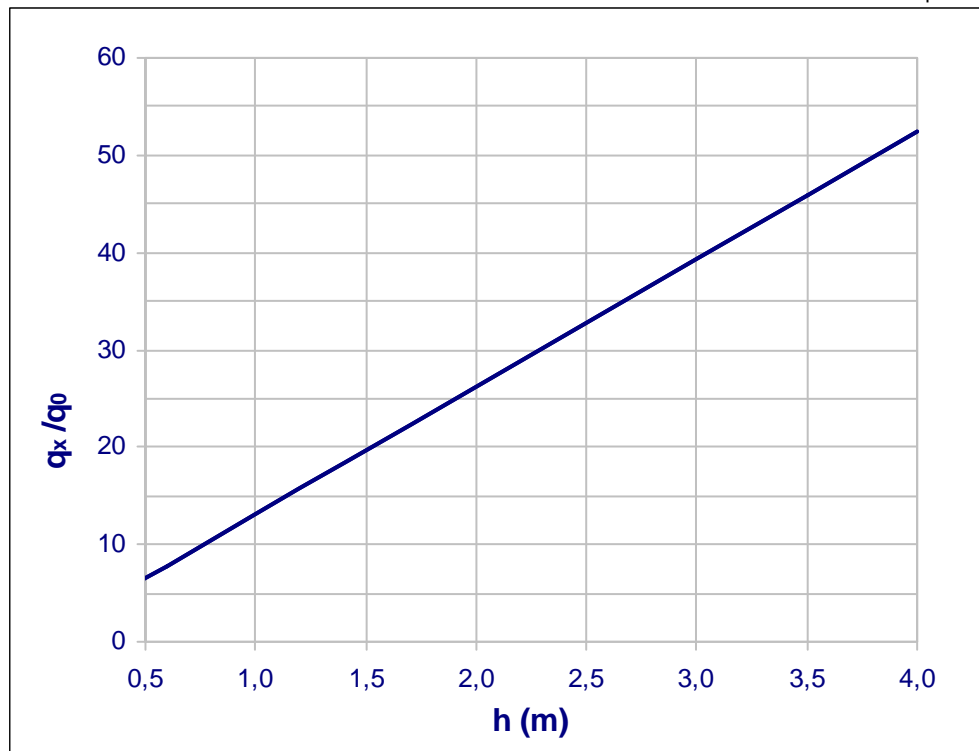
Temperature quotient

Graph 5



Induction rate

Graph 6



Selection example. DSA diffuser

In selecting the element for this type of diffusion, i.e. floor-level diffusion with temperature jumps no greater than $\pm 6^\circ\text{C}$, it is recommended not to exceed effective air velocity (V_K) of 1.5 – 2 m/s to avoid generating irritating air currents in the occupied area (>0.25 m/s). This is particularly relevant when using this type of diffuser under seats in locations such as auditoriums.

Shown below is an example giving a graph-based explanation of the selection method.

Design data

Auditorium with 410 seats. Total air supply volume in seating area: 22,500 m³/h.
 Supply temperature: 19°C. Room temperature: 23°C.
 Installation of one diffuser per seat; volume per diffuser: 55 m³/h.

Results

Given the volume per diffuser (55 m³/h), taking into account the aforementioned selection criteria for this type of installation ($V_K < 2$ m/s), according to the selection table (page 6) the appropriate model would be the DSA 200.

To find out the sound power level and pressure drop for this model, refer to selection graph 2. This gives us the following information:

Pressure drop: **4 Pa**
 Sound power level: **<20 dB(A)**

To find out the air velocity at the height of the seat (around 0.5 m), refer to selection graph 4. This gives us the following information:

Corrected velocity " V_h " at a height "h" of 0.5 m and with $\Delta T = -4^\circ\text{C}$:

$$V_h = 0.32 \times 1.15 = 0.37 \text{ m/s}$$

Product code. Example

The product code describes the model ordered by the customer.

DSA	Circular floor Swirl Diffuser, standard footwear
DSA-K	Circular floor Swirl Diffuser, high point load shoes
Ø150	Diffuser size
Ø200	Diffuser size
ØP	Connection plenum box
–	Manufactured in aluminium (DSA)
–	Manufactured in steel sheet (DSA-K)
RAL	RAL coating upon request

Example:

DSA-200-P

Circular diffuser manufactured in aluminium with swirl air supply, 200 mm diameter and plenum

DF-CP-MT Step Swirl Diffuser



DESCRIPTION

The DF-CP-MT step swirl diffusers consist of a rectangular front plate incorporating 2 to 6 micro diffusers in a standard configuration.

The units are manufactured from sheet steel and come with a black coating (RAL 9005) as standard.

The diffuser can also be fitted with a connection plenum (front or side) in galvanised sheet steel.

The diffusers have a highly appealing aesthetics and may be coated in a different colour (upon request) to adapt to the décor of the installation site



APPLICATIONS

DF-CP-MT series diffusers are designed to provide air conditioning in theatres, auditoriums, cinemas, etc., offering a low profile that allows installation in low-level steps or stairs of a limited height.

In the aforementioned locations, the diffusers are generally installed with one unit per seat, generating an individual microclimate which guarantees the necessary air ventilation for each person.

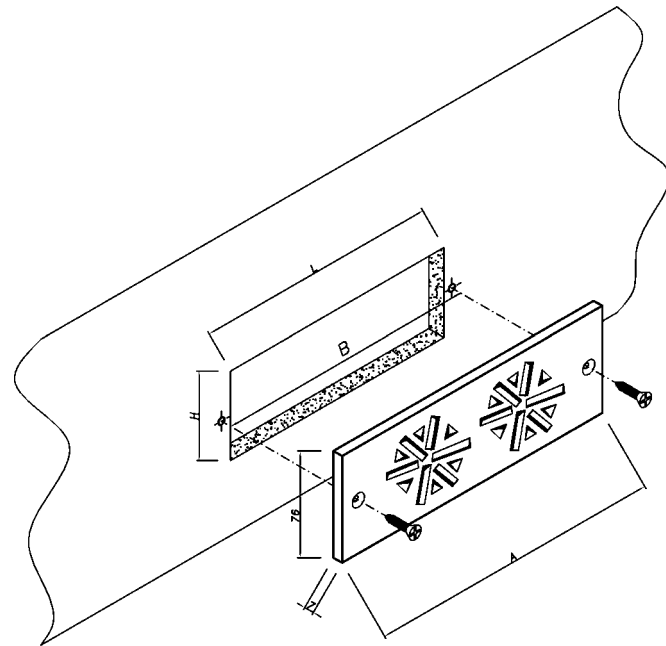
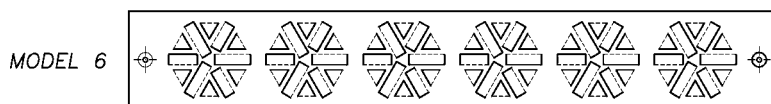
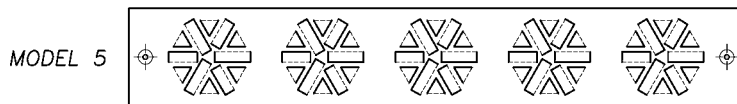
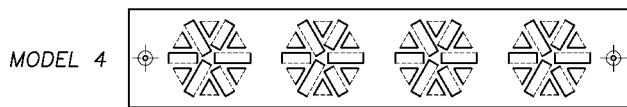
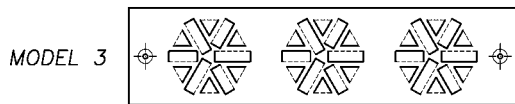
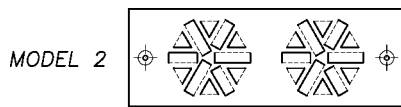
Given that the distance from the diffuser plate to the person's legs is very short, it is recommended to work with a maximum temperature difference (supply temp./room temp.) of ± 6 °C to avoid generating bothersome air currents.

Models and dimensions. DF-CP-MT diffuser

DF-CP-MT series diffusers can be manufactured in sets of 2, 3, 4, 5, or 6 swirl micro-diffusers.

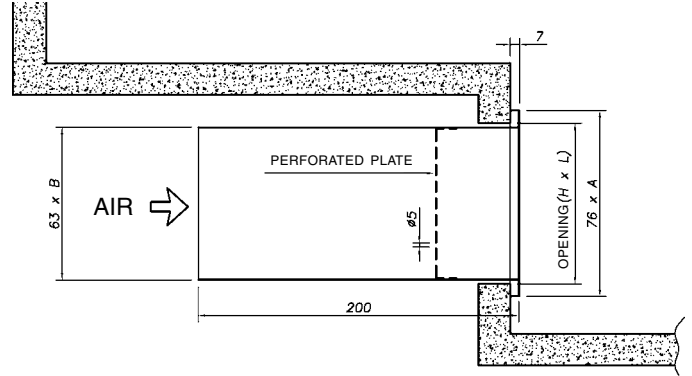
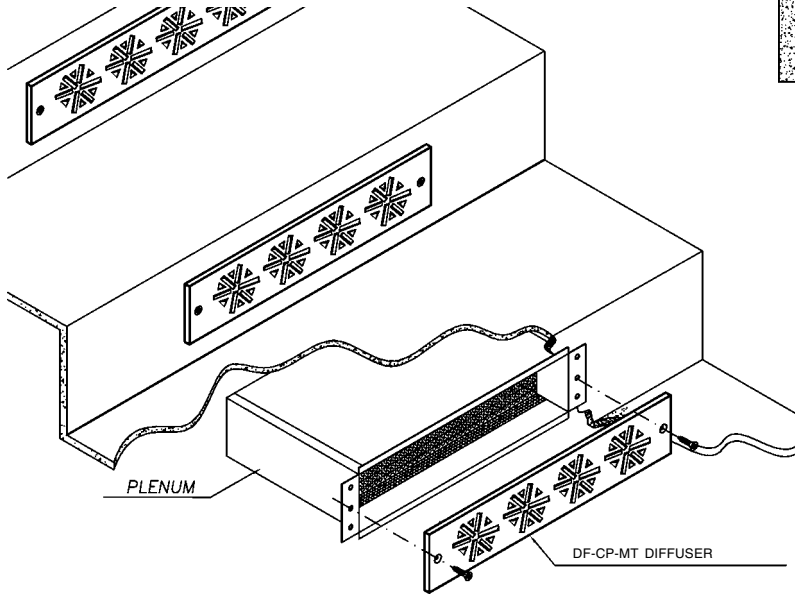
The diffusers can also be supplied with a plenum at the customer's request.

The diffusers come in the following models:



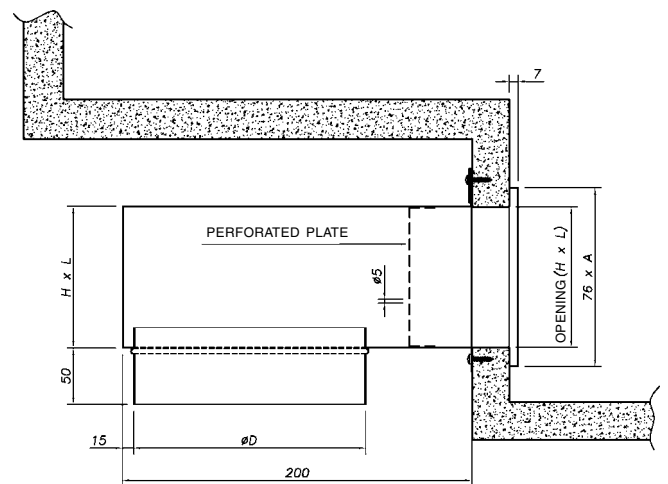
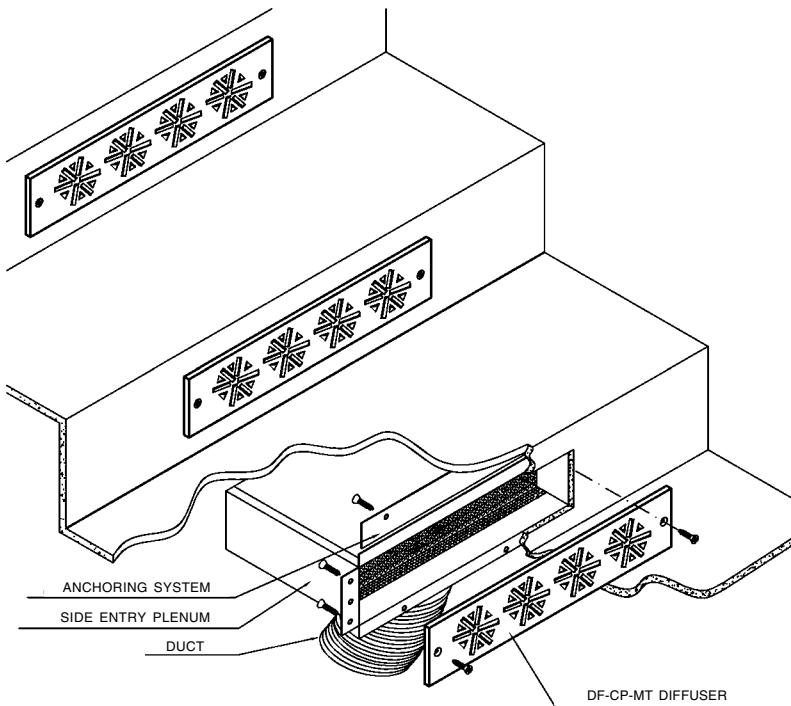
MODELS	NOMINAL		
	LxH	A	B
DF-CP-MT-2	165 x 65	212,5	186,5
DF-CP-MT-3	250 x 65	300	274
DF-CP-MT-4	340 x 65	387	361,5
DF-CP-MT-5	425 x 65	475	449
DF-CP-MT-6	450 x 65	500	474

TOP ENTRY PLENUM



MODELS	NOMINAL	A	B
	LxH		
DF-CP-MT-2	165 x 65	212,5	160
DF-CP-MT-3	250 x 65	300	245
DF-CP-MT-4	340 x 65	387,5	335
DF-CP-MT-5	425 x 65	475	420
DF-CP-MT-6	450 x 65	500	445

SIDE ENTRY PLENUM



MODELS	NOMINAL	A	ØD
	LxH		
DF-CP-MT-2	165 x 65	212,5	79
DF-CP-MT-3	250 x 65	300	
DF-CP-MT-4	340 x 65	387,5	
DF-CP-MT-5	425 x 65	475	99
DF-CP-MT-6	450 x 65	500	

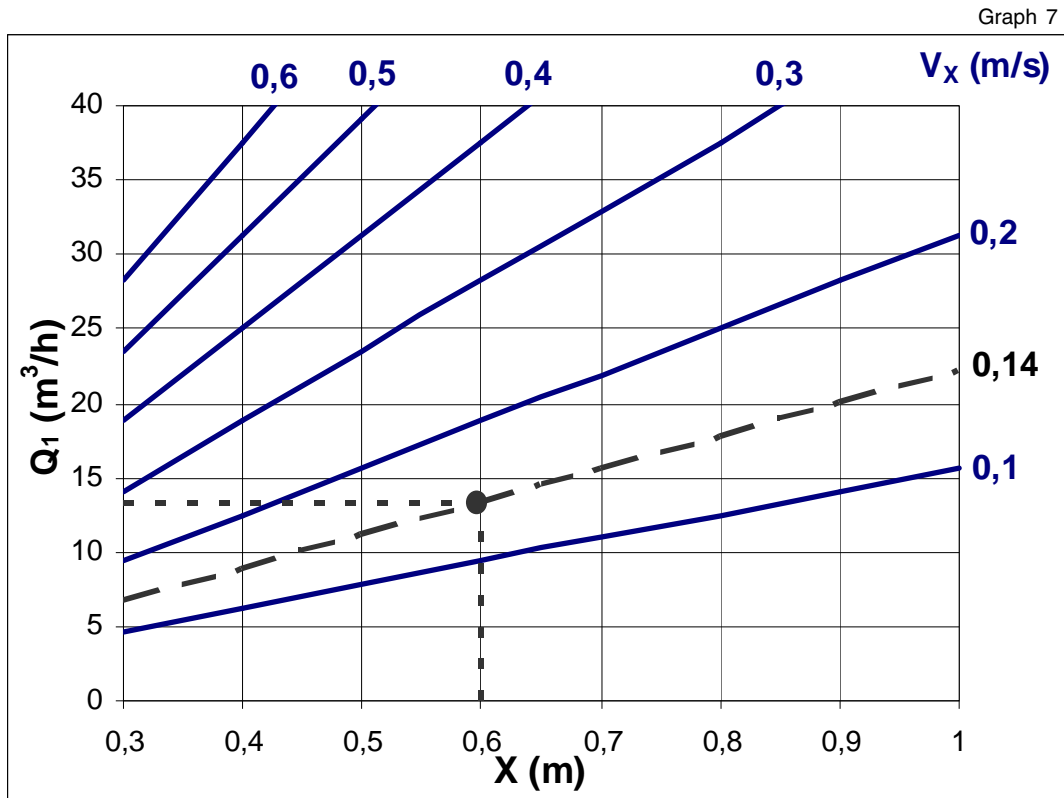
Technical data. DF-CP-MT diffuser

SOUNDS LEVEL SELECTION TABLE:

The air flow rate and pressure drop (values in parenthesis) for each diffuser size are determined according to the desired sound level

AIR FLOW - SOUND POWER - PRESSURE DROP					
DF-CP-MT	m3/h (Pa)				
	25 dB(A)	30 dB(A)	35 dB(A)	40 dB(A)	45 dB(A)
2	26 (15)	32 (22)	39 (32)	48 (48)	59 (72)
3	37 (13)	45 (19)	55 (29)	67 (42)	82 (62)
4	47 (12)	57 (17)	70 (26)	85 (38)	104 (56)
5	56 (11)	69 (16)	84 (24)	102 (35)	125 (52)
6	65 (10)	80 (15)	98 (23)	119 (33)	145 (49)

The graph below shows the air velocity (of a micro-diffuser) measured at 100 mm from the floor according to the height of the unit. Depending on the number of elements that make up the plate, the velocity value shown in the graph is multiplied by that shown in table 2.

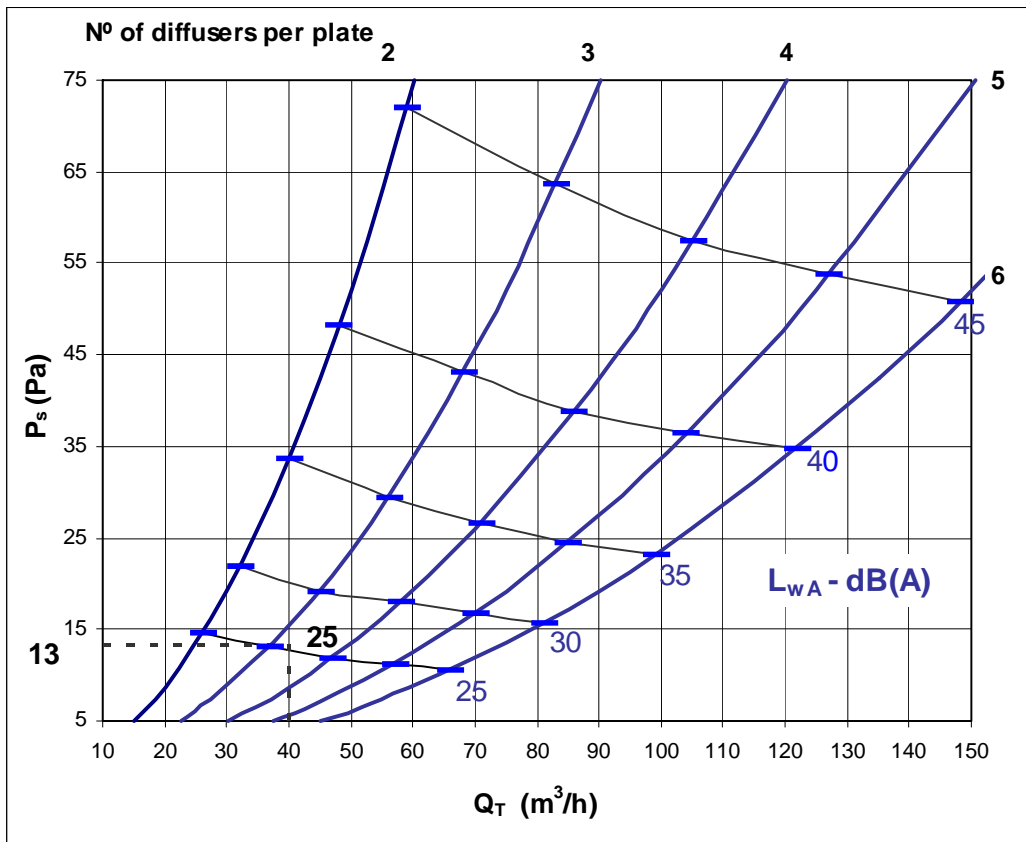


Nº micro-diffusers	2	3	4	5	6
V_x	1,41	1,73	2	2,24	2,45

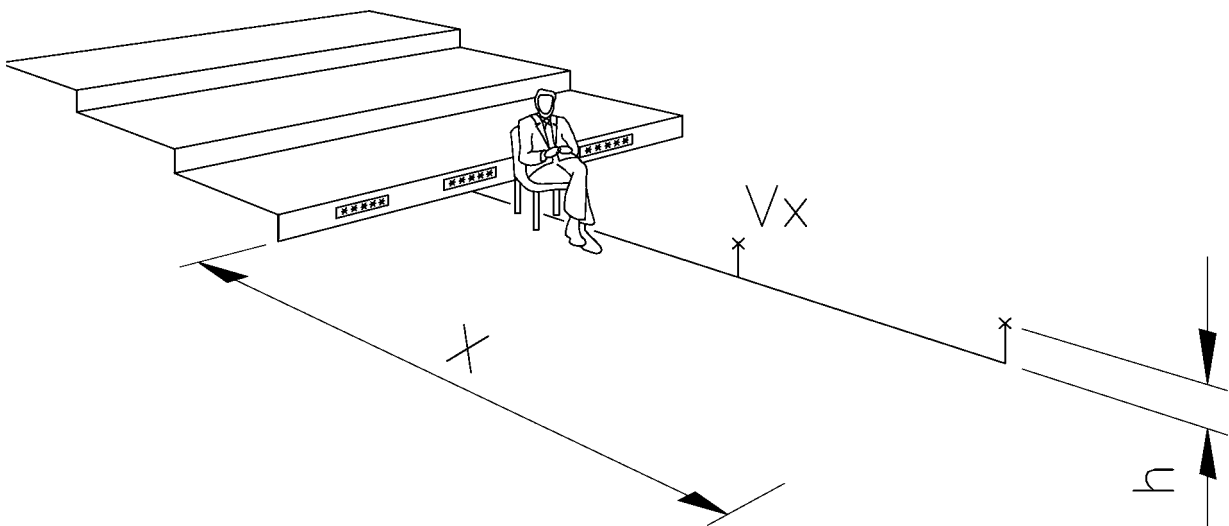
Table 2: Correction values for 2 to 6 micro-diffusers

The graph below shows the sound level and pressure drop per plate, taking into account the number of diffusers installed.

Graph 8



EXPLICATIVE DRAWING:



SYMBOLS:

- Q_1 Supply flow per diffuser element in m³/h.
- Q_T Supply flow per plate in m³/h
- V_x Velocity of diffuser element at distance X in m/s.
- X Distance to diffuser in metres
- h Height of measurement point above the ground in metres
- P_s Pressure drop of the plate in Pa
- $dB(A)$ Sound power level of the plate

Selection example. DF-CP-MT diffuser

The selection table and graph shown in the present catalogue for the different existing models (diffusers without plenum) allow us to obtain, based on a supply flow per diffuser plate, the following parameters:

- Pressure drop and sound power level generated by the diffuser
- Velocity at a specific distance, measured at a height of 0.1 m above the ground

Our methodology can be explained by means of an example:

Preliminary data

A theatre with 200 seats requires the installation of DF-CP-MT step diffusers. The total supply volume for this type of diffuser is 8,000 m³/h, supplying 40 m³/h per diffuser. Diffuser model DF-CP-MT-3 is to be installed in the tread of the step.

Height of installation above ground: $h = 0.1$ m
 Distance to diffuser (velocity measurement): $X = 0.6$ m
 Height of measurement point above the ground: $h_1 = 0.1$ m
 Volume per micro-diffuser: $Q_1 = 13.3$ m³/h

Results

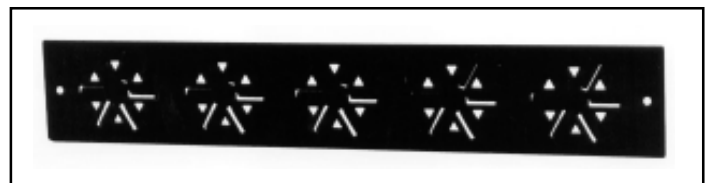
By looking at both the sound power level and velocity graphs and applying the correction factor by the number of micro-diffusers, this gives us:

Pressure drop: **13 Pa**
 Sound power level: **25 dB(A)**
 Corrected velocity at a distance of 0.6 m from the diffuser: $V_x = 0.24$ m/s

Product code. Example

The product code describes the model ordered by the customer.

DF-CP-MT	Step Swirl Diffuser
2...6	Nº of micro-diffusers
PS	Top entry plenum
PL	Side entry plenum
RAL 9005	Standard gloss black coating



Example:

DF-CP-MT-5-Ral 9005 Satin

Step swirl diffuser, with 5 micro-diffusers and RAL 9005 coating, designed for standard screw mounted installation.

