

Adjustable swirl diffuser PDZ



Swirl diffuser with external ring equipped with light elements



Horizontal air flow for cooling function

Adjustable swirl diffuser PDZ ensures a very effective ventilation in public premises such as supermarkets, warehouses, industry areas etc. Diffusers are easily mounted in false ceiling or under the ceiling directly to the duct.

The diffusers unique possibility to change the air diffusion from heating to cooling function the diffuser can be fitted to every prevalent room conditions. When the internal core with blades is moved downwards, heating function is obtained - vertical air flow. On the other hand when the internal core with blades is moved back upwards, the cooling function is realized - horizontal air flow. The change of the diffusion pattern can be achieved manually or automatically by using a servo motor.

Adjustable swirl diffuser PDZ has an air flow range of between 56 and 1 300 l/s (200 - 4 700 m³/h) with a maximal throw length of 21 m.

Due to the possibility of changing the diffuser material in the external ring, PDZ can be adopted to every interior decorations. Additionally the external ring can be equipped with light elements.

Quick-selection

Size	Air flow		Pressure drop, Pa	Installation height above the floor, m
	l/s	m ³ /h		
PDZ-250	56 - 330	200 - 1200	5 - 315	3 - 15
PDZ-315	97 - 530	350 - 1900	6 - 310	3 - 18
PDZ-355	110 - 670	400 - 2400	5 - 310	3 - 18
PDZ400	150 - 830	550 - 3000	6 - 300	4 - 18
PDZ-500	250 - 1300	900 - 4700	6 - 300	4 - 22

Product facts

Adjustable swirl diffuser PDZ

Intended for ceiling installation

Adjustable diffusion pattern, both for heating or cooling

Suitable for rapid heating of premises

Broad flow range

Product code example:

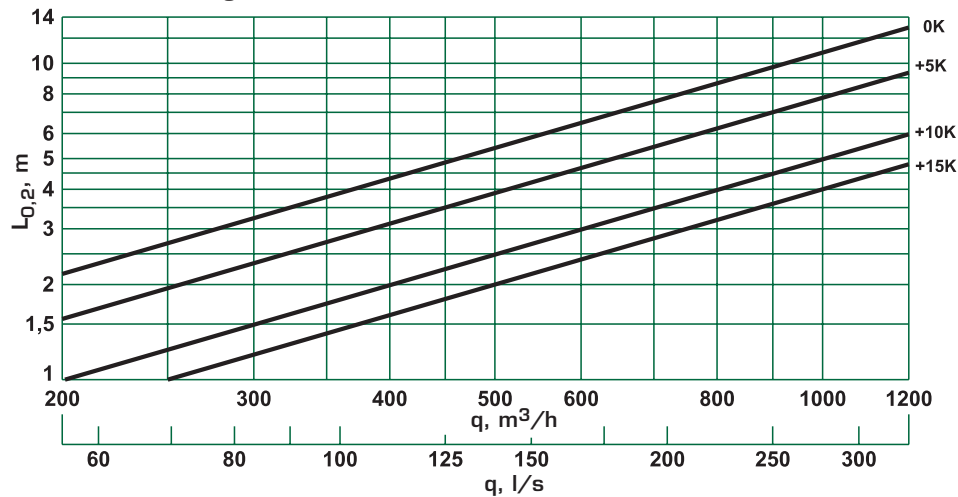
Adjustable swirl diffuser PDZ-355-2-1.

Diffuser of size 355 with external ring, rubber gasket and servo-motor adjusted diffusion pattern.

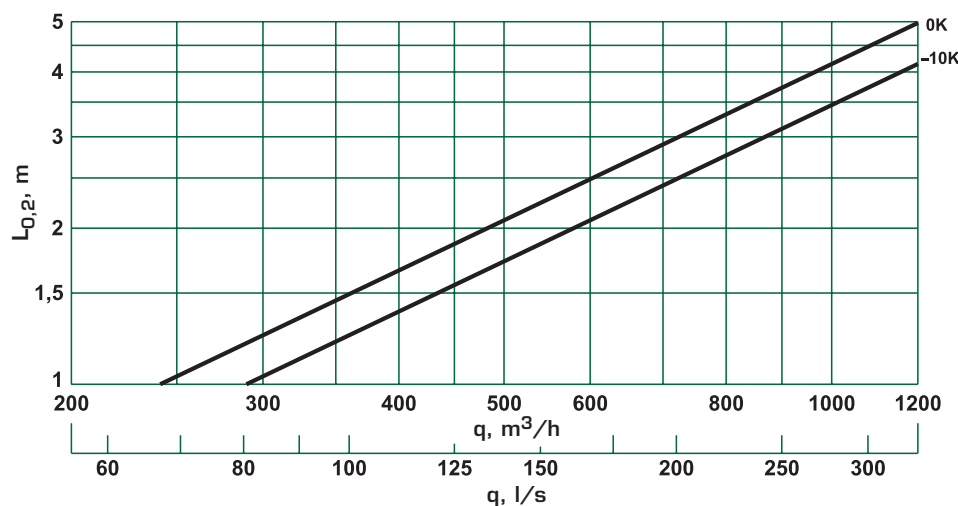
The diffuser is painted in colour RAL 9010.

Air flow, throw, pressure drop, sound level

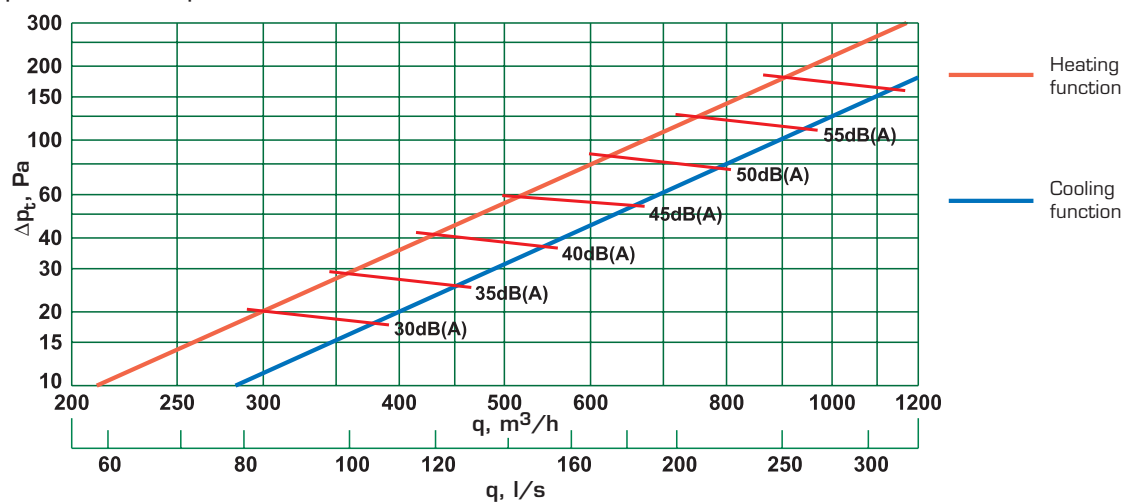
PDZ-250 – throw for heating function



PDZ-250 – throw for cooling function



PDZ-250 – pressure drop and sound level



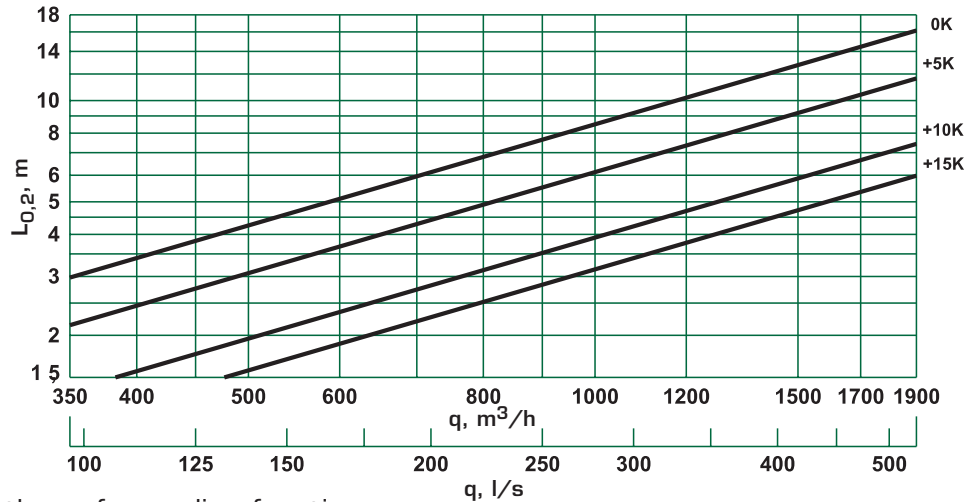
In the above graphs the sound levels are indicated in dB(A) for a reference room with 10 m² room absorption, equivalent to 4 dB room attenuation.

Maximum temperature difference at heating, $\Delta t_h \leq 15K$

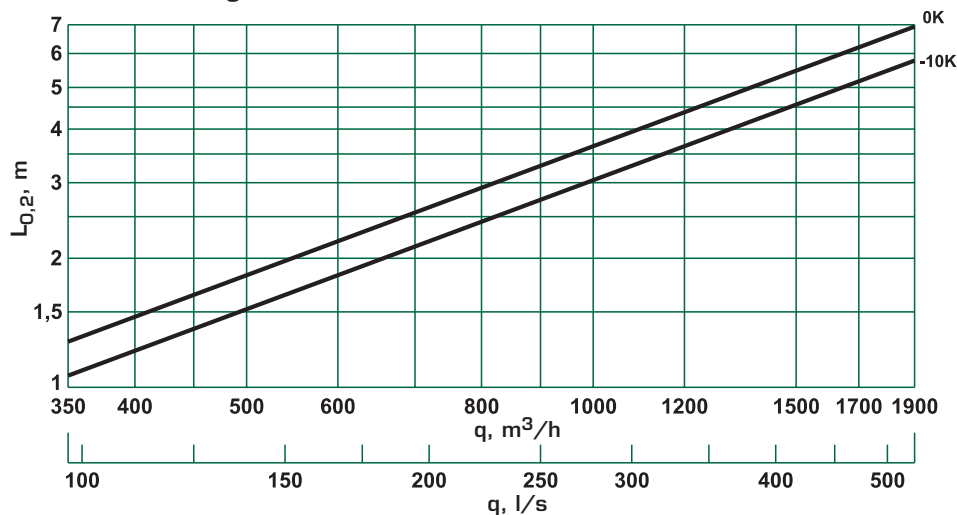
Maximum temperature difference at cooling, $\Delta t_c \leq 12K$

Air flow, throw, pressure drop, sound level

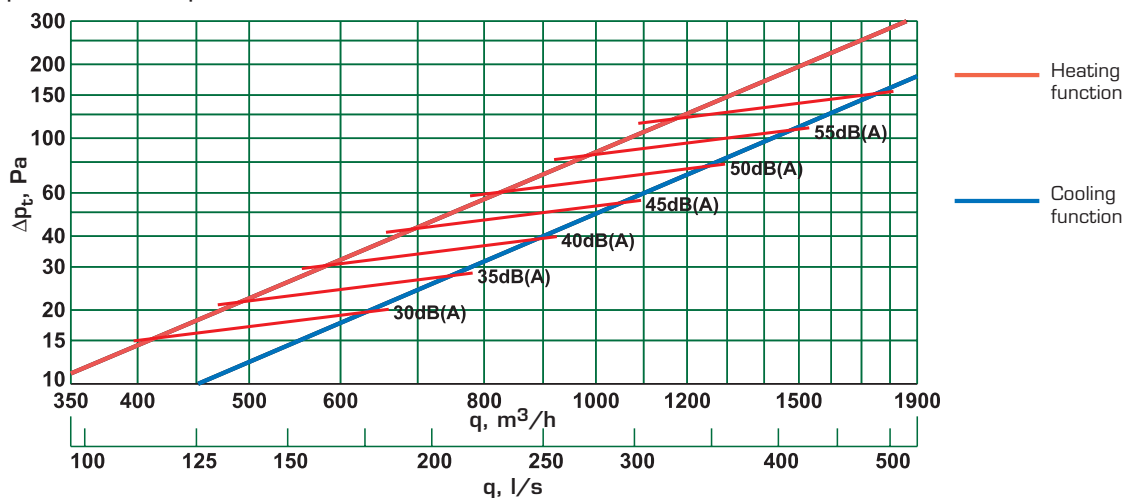
PDZ-315 – throw for heating function



PDZ-315 – throw for cooling function



PDZ-315 – pressure drop and sound level



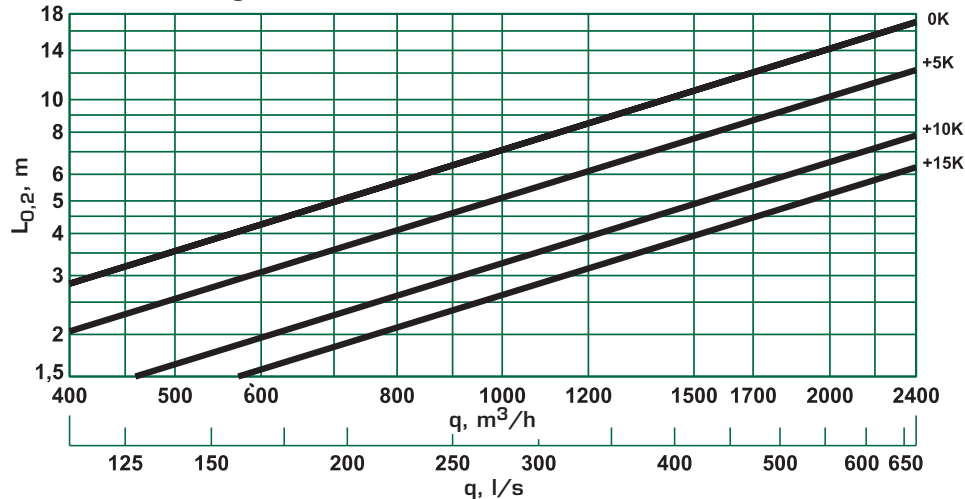
In the above graphs the sound levels are indicated in dB(A) for a reference room with 10 m^2 room absorption, equivalent to 4 dB room attenuation.

Maximum temperature difference at heating, $\Delta t_h \leq 15K$

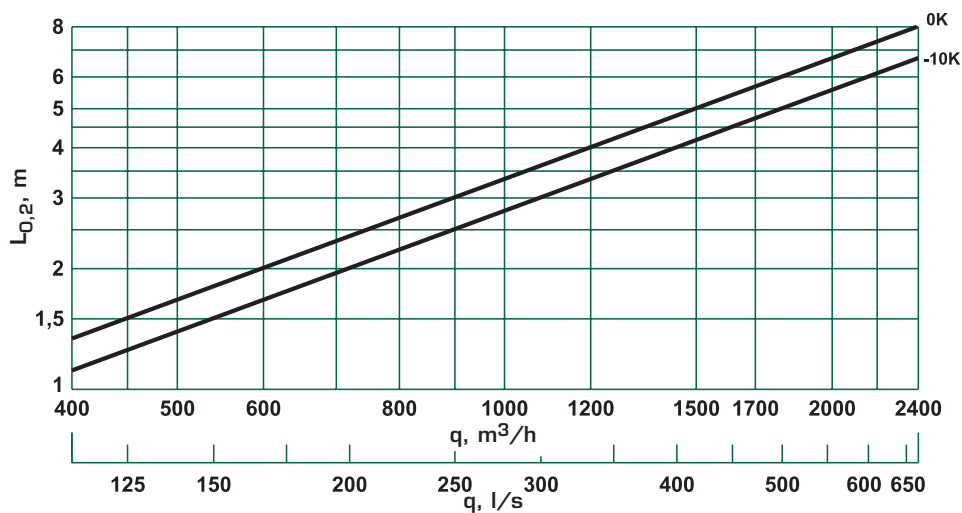
Maximum temperature difference at cooling, $\Delta t_c \leq 12K$

Air flow, throw, pressure drop, sound level

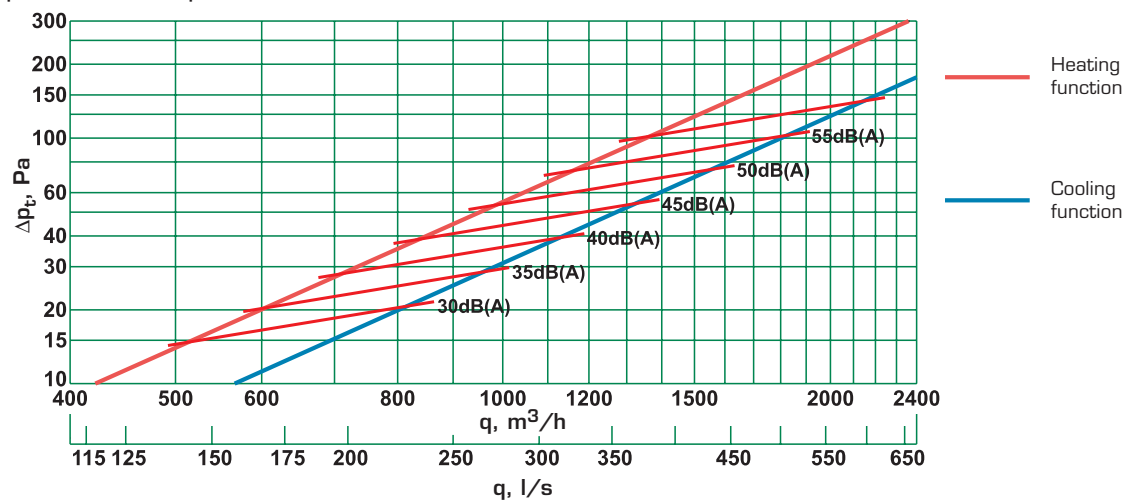
PDZ-355 – throw for heating function



PDZ-355 – throw for cooling function



PDZ-355 – pressure drop and sound level



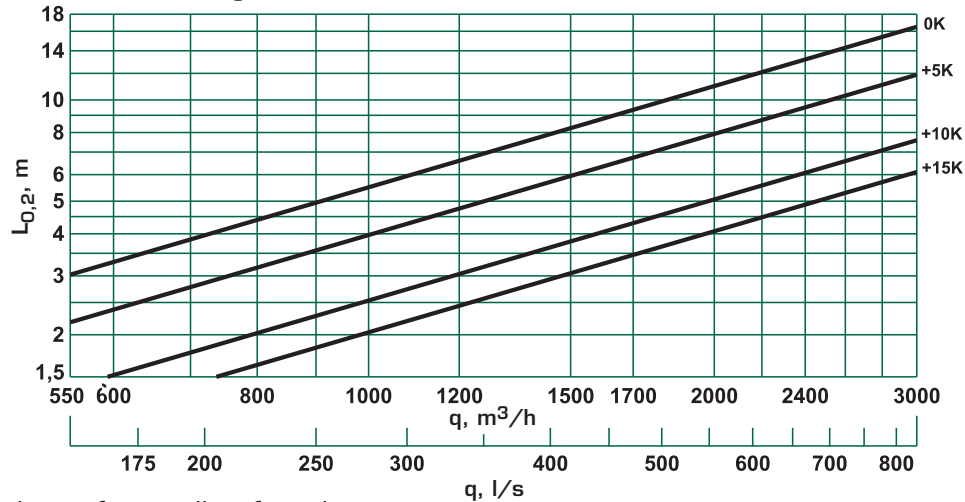
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Maximum temperature difference at heating, $\Delta t_h \leq 15K$

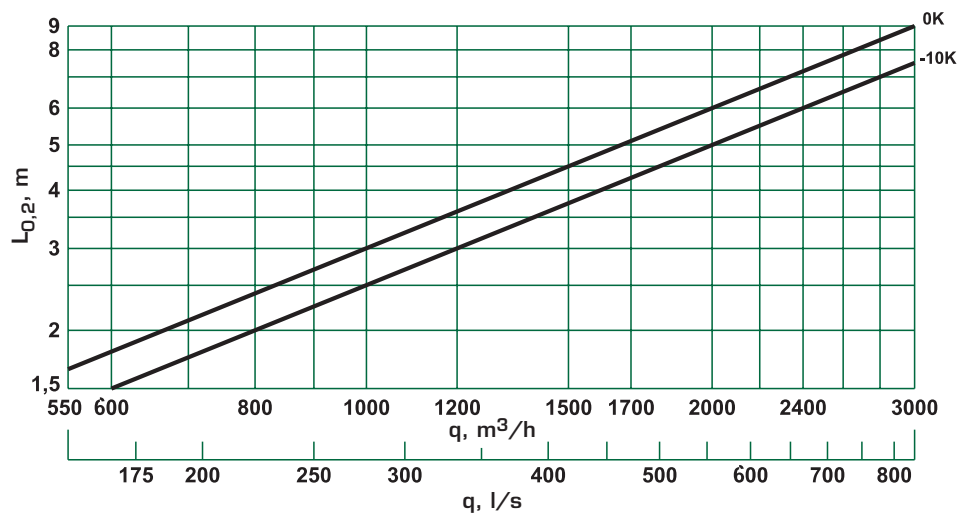
Maximum temperature difference at cooling, $\Delta t_c \leq 12K$

Air flow, throw, pressure drop, sound level

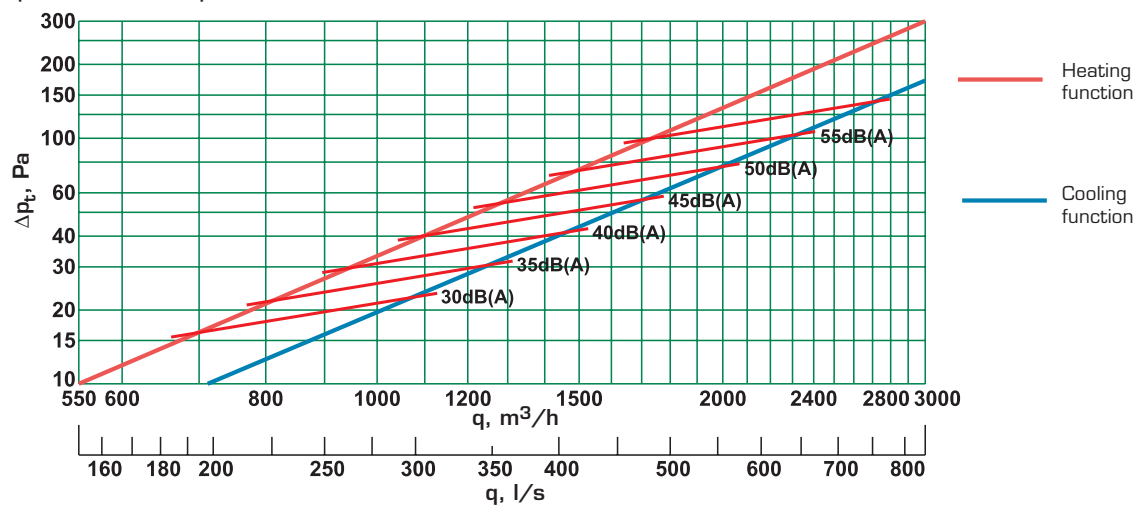
PDZ-400 – throw for heating function



PDZ-400 – throw for cooling function



PDZ-400 – pressure drop and sound level



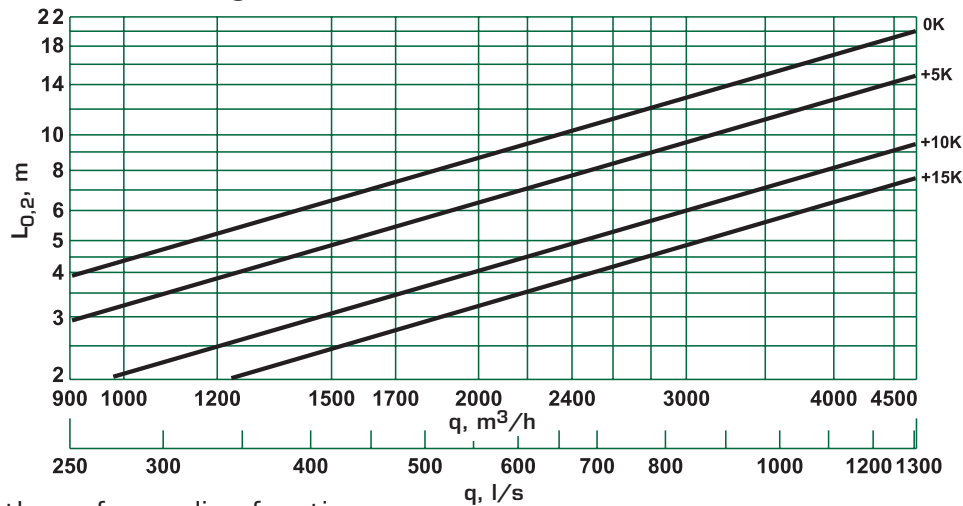
In the above graphs the sound levels are indicated in dB(A) for a reference room with 10 m² room absorption, equivalent to 4 dB room attenuation.

Maximum temperature difference at heating, $\Delta t_h \leq 15K$

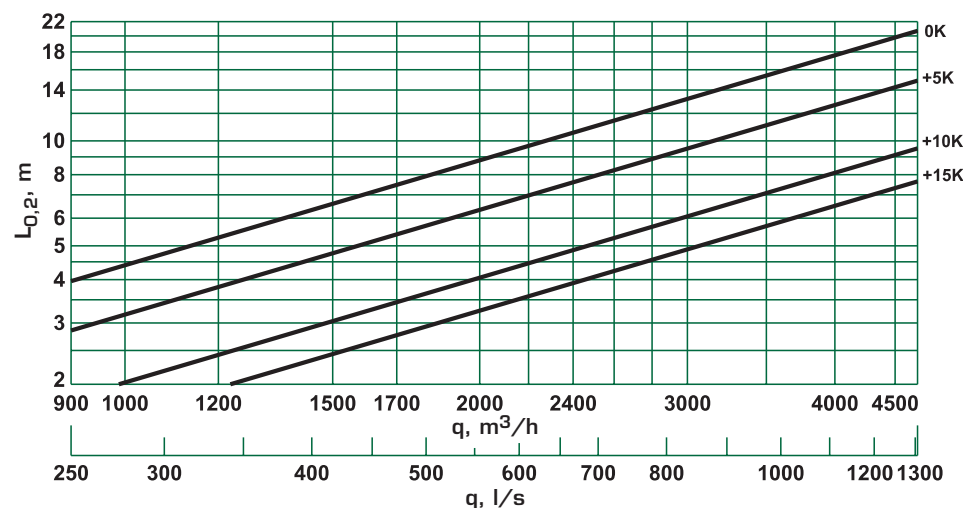
Maximum temperature difference at cooling, $\Delta t_c \leq 12K$

Air flow, throw, pressure drop, sound level

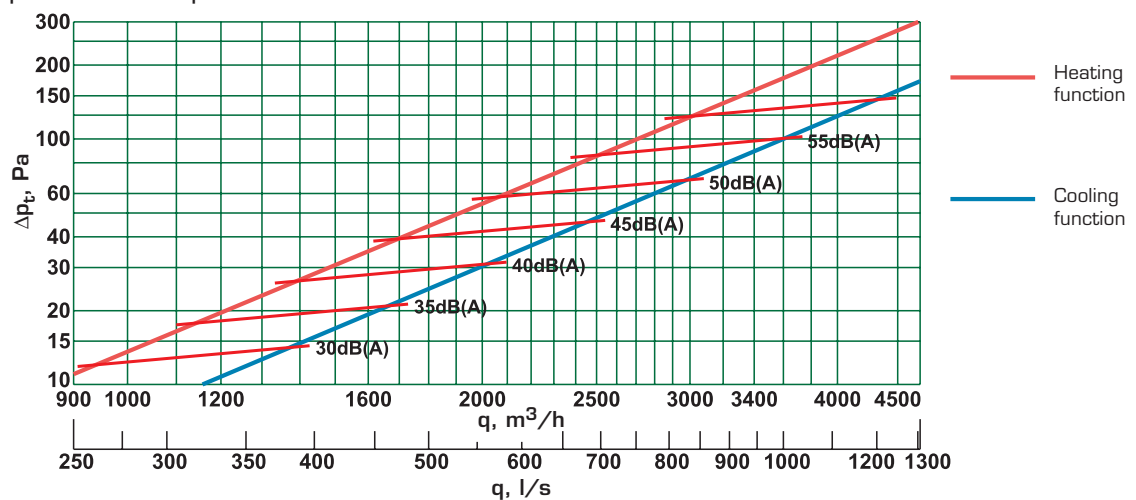
PDZ-500 – throw for heating function



PDZ-500 – throw for cooling function



PDZ-500 – pressure drop and sound level



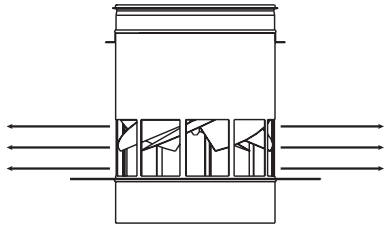
In the above graphs the sound levels are indicated in dB(A) for a reference room with 10 m² room absorption, equivalent to 4 dB room attenuation.

Maximum temperature difference at heating, $\Delta t_h \leq 15K$

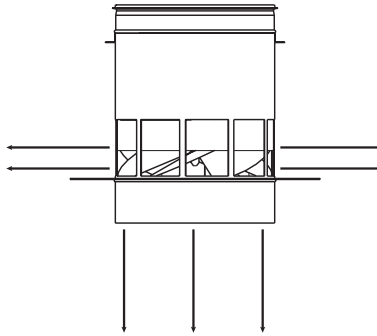
Maximum temperature difference at cooling, $\Delta t_c \leq 12K$

Diffuser operation, sound data, dimensions

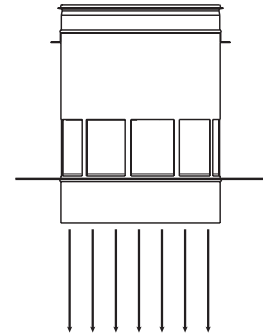
Diffuser operation – air diffusion



Horizontal air diffusion - cooling function.
Internal core outlet with blades moved back entirely.



Combined air diffusion.
Internal core outlet with blades moved partly.



Vertical air diffusion - heating function.
Internal core outlet with blades moved out entirely.

Sound power level

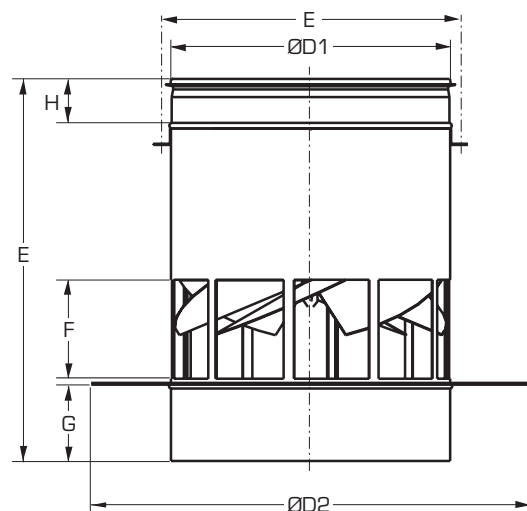
Size	Correction of sound level K_{ok} in dB for octave bands, mean frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
250	7	1	1	-5	-4	-6	-14	-26
315	6	0	0	-4	-6	-8	-15	-24
355	5	1	-1	-2	-6	-10	-15	-25
400	3	0	-1	-2	-5	-12	-16	-25
500	3	-1	-1	-2	-5	-12	-14	-25

The sound power levels for different octave bands are obtained by adding together the sound pressure level L_{A10} in dB(A), and the corrections K_{ok} for the octave bands in the table with the help of the following formula:

$$L_W = L_{A10} + K_{ok}$$

Correction K_{ok} is the mean value for the range of application of PDZ.

Dimensions



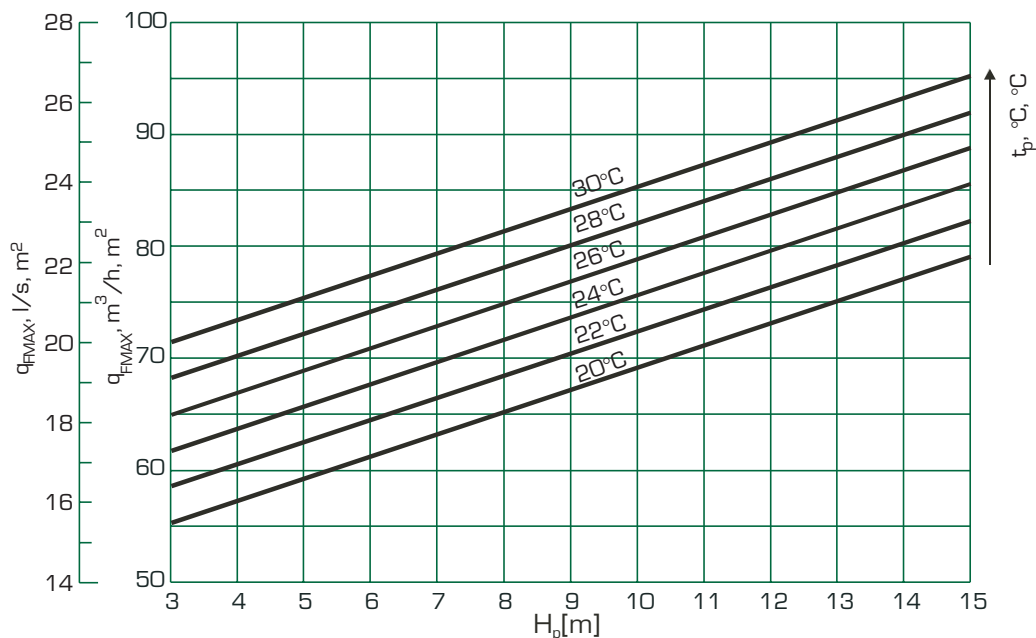
Sound attenuation

Size	Sound attenuation in dB for octave band, mean frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
250	3	5	4	8	7	3	4	2
315	3	5	3	9	7	3	4	2
355	4	3	2	7	7	4	4	3
400	5	2	1	6	7	5	5	3
500	7	4	3	6	8	6	4	5

Size	ØD1	ØD2	C	E	F	G	H
250	250	400	427	282	93	76	40
315	315	490	443	347	116	88	40
355	355	560	480	387	128	99	40
400	400	620	548	432	142	110	60
500	500	780	635	533	179	123	50

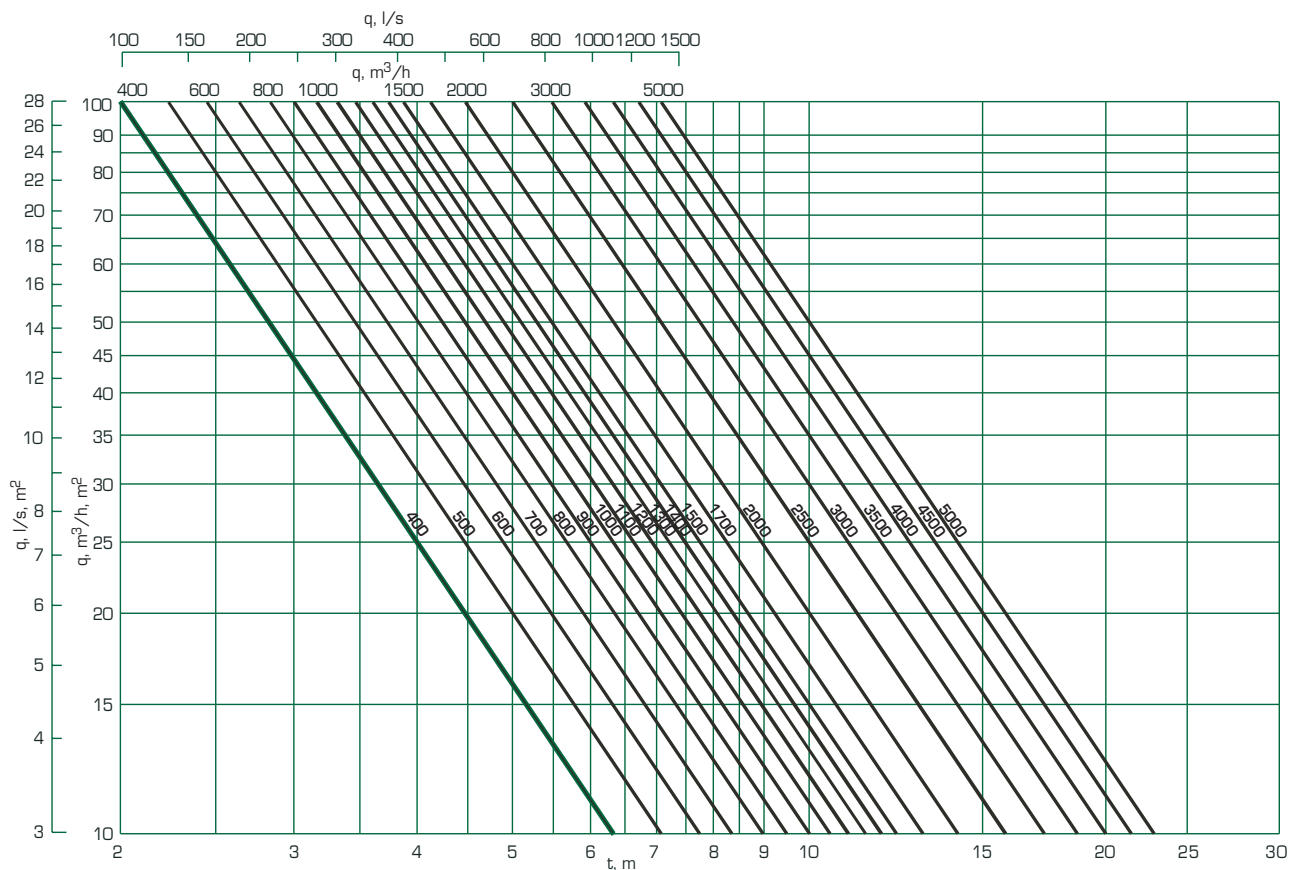
Volume air flow, min distance between diffusers

Max volume air flow¹⁾



¹⁾ Assumes that the occupied zone is approx. 2 m and that the covering factor is 0.5 – 0.6 clo.
Premises who fulfils these conditions are i. g. sport halls, warehouses and light industry halls.

Min distance between diffusers



Project design example, definitions

Project design example

Definitions

q_{tot}	total air flow	m^3/h
q_D	diffuser air flow	m^3/h
q_V	volume air flow	$\text{m}^3/\text{h} \times \text{m}^2$
A	served floor area	m^2
H_p	installation height above the floor	m
t	distance between diffusers	m
t_{min}	minimum distance between diffusers	m
t_r	room temperature	$^{\circ}\text{C}$
Δt_v	temperature difference between the supply air and the room air	K
$L_{0.2}$	throw equivalent to 0.2 m/s in final velocity	m
H_W	height of occupied zone	m

Assumptions

Total air flow $q_{\text{tot}} = 29\,000 \text{ m}^3/\text{h}$
 Served floor area, $A = 2\,000 \text{ m}^2$
 Room temperature $t_r = 24^{\circ}\text{C}$
 Installation height above the floor, $H_p = L_{0.2} + H_W$
 Height of occupied zone = 1.8 m

1. Choice of diffuser, size PDZ-400

Assumed number of diffusers, n	18 pcs.
Diffuser air flow, q_D	$1\,610 \text{ m}^3/\text{h}$
Throw, $L_{0.2}$ (from graph)	4.2 m
Installation height above the floor, H_p	$4.2 + 1.8 = 6.0 \text{ m}$
Estimated Δt_v for heating	+10 K
Min air flow taken from the graph for the diffuser heating function	$1\,610 \text{ m}^3/\text{h}$
Assumed distance between diffusers, t	10.0 m
Volume air flow, q_V (from graph)	$16.1 \text{ m}^3/\text{h} \times \text{m}^2$
Max volume air flow, for $H_p = 6.0 \text{ m}$ och $t_r = 24^{\circ}\text{C}$	$68 \text{ m}^3/\text{h} \times \text{m}^2$
Min distance between diffusers, t_{min} where $q_{V\text{max}} = 68 \text{ m}^3/\text{h} \times \text{m}^2$ is not exceeded	4.9 m

2. Choice of diffuser, size PDZ-315

Assumed number of diffusers, n	27 pcs.
Diffuser air flow, q_D	$1\,070 \text{ m}^3/\text{h}$
Throw, $L_{0.2}$ (from graph)	4.2 m
Installation height above the floor, H_p	$4.2 + 1.8 = 6.0 \text{ m}$
Estimated Δt_v for heating	+10 K
Min air flow taken from the graph for the diffuser heating function	$1\,070 \text{ m}^3/\text{h}$
Assumed distance between diffusers, t	8.0 m
Volume air flow, q_V (from graph)	$16.7 \text{ m}^3/\text{h} \times \text{m}^2$
Max volume air flow, for $H_p = 6.0 \text{ m}$ and $t_r = 24^{\circ}\text{C}$	$68 \text{ m}^3/\text{h} \times \text{m}^2$
Min distance between diffusers, t_{min} where $q_{V\text{max}} = 68 \text{ m}^3/\text{h} \times \text{m}^2$ is not exceeded	4.0 m

Descriptive text, product code

Descriptive text

Adjustable swirl diffuser PDZ for ceiling installation manufactured by Fläkt Woods in size, e.g. 355, with external ring.

Product code

Adjustable swirl diffuser

PDZ-aaa-b-c

Size

250, 315, 355, 400, 500

Diffuser operation of air diffusion

1 = manual adjustment
2 = servo motor

Diffuser colour (shown as a RAL colour)

1 = colour 9010 (if any other colour is wanted this is indicated with X in the code and the proper RALcode).

Duct connection with a rubber gasket except size 355