

SDZ Swirl diffuser



Swirl diffuser SDZ is intended for public buildings with a large volume, for example market halls, department stores, public arenas, etc.

The function of the diffuser can be adapted to both summer and winter conditions.

The air flow pattern is varied by opening or closing the inner centre outlet and by changing the position of the outer outlet.

The maximum air flow throw of 15 m is achieved when the inner centre outlet is fully open and the outer diffuser outlet is withdrawn.

When the inner centre outlet is closed and the outer cylinder is pushed back, the air flow is radial and at its shortest. The radial flow is at its most effective when the supply air is cold.

Swirl diffuser SDZ has an air flow range of between 125 and 3 330 l/s (450 - 12 000 m³/h) and has a throw of between 3 and 15 m.

SDZ can be adjusted manually or with the help of an electric actuator and can also interact with control system USN3-R.

Quick-selection

Diffuser size	Air flow		Pressure drop, Pa	Installation height H _p , m
	l/s	m ³ /h		
SDZ-315	125 - 556	450 - 2000	12 - 220	3 - 8
SDZ-400	278 - 1056	1000 - 3800	35 - 300	3 - 12
SDZ-500	417 - 1528	1500 - 5500	40 - 350	4 - 13
SDZ-630	694 - 2500	2500 - 9000	30 - 350	5 - 14
SDZ-710	972 - 3056	3500 - 11000	45 - 300	5 - 15

Product facts

Swirl diffuser SDZ

Installed with a connection box or directly to a duct in the ceiling

Adjustable throw and diffusion direction

Broad flow range

Five sizes

Product code example:

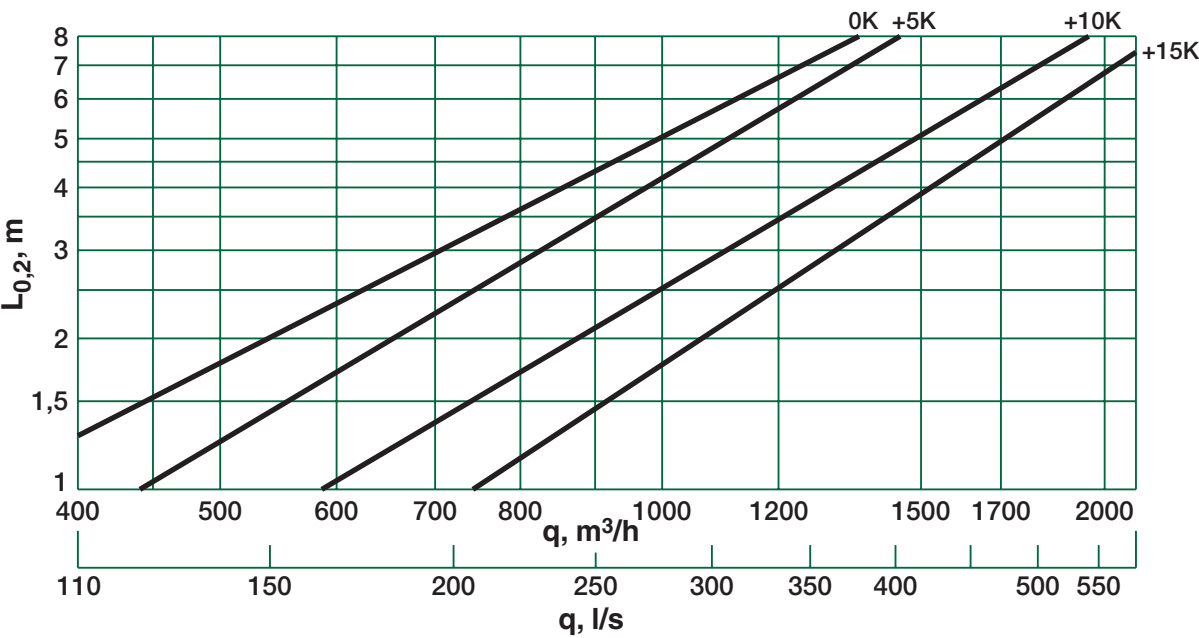
Swirl diffuser SDZ-500-2-1.

Size 500 with electric regulation of both throw and air direction. The diffuser is painted in colour RAL 9010.

Connection box SKR-500-1-1. Size 500 to fit diffuser size 500, insulated with measurement and balancing damper and with rubber seals on the duct connections.

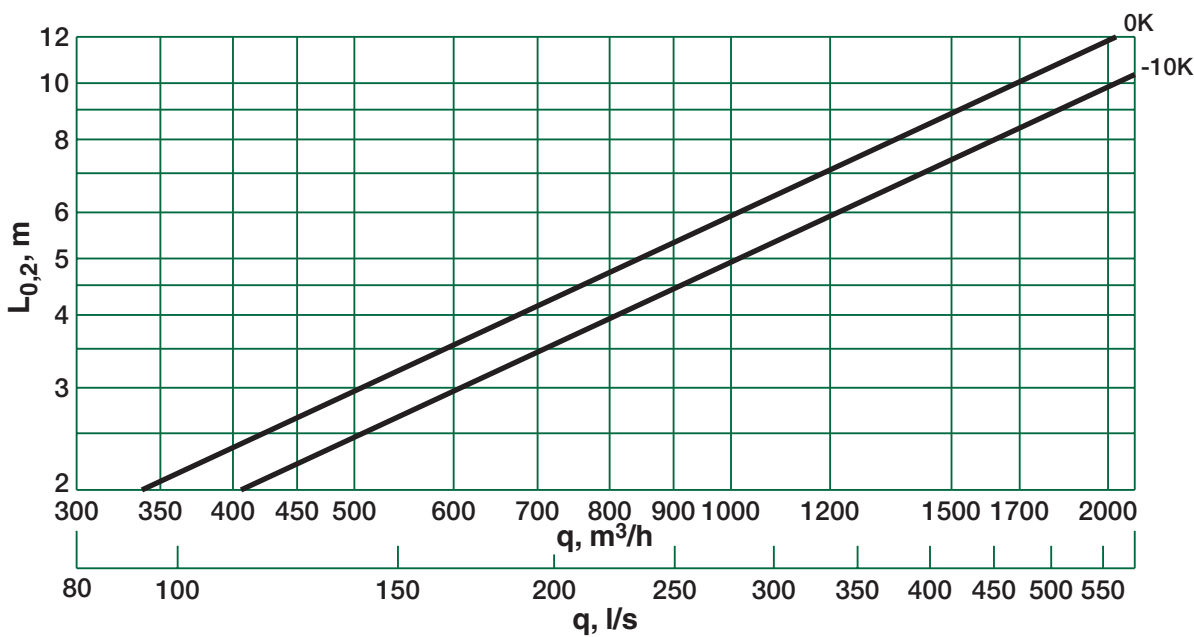
Throw

SDZ-315 – throw for heating function



Max temperature difference for heating: $\Delta t \leq +15$ K.

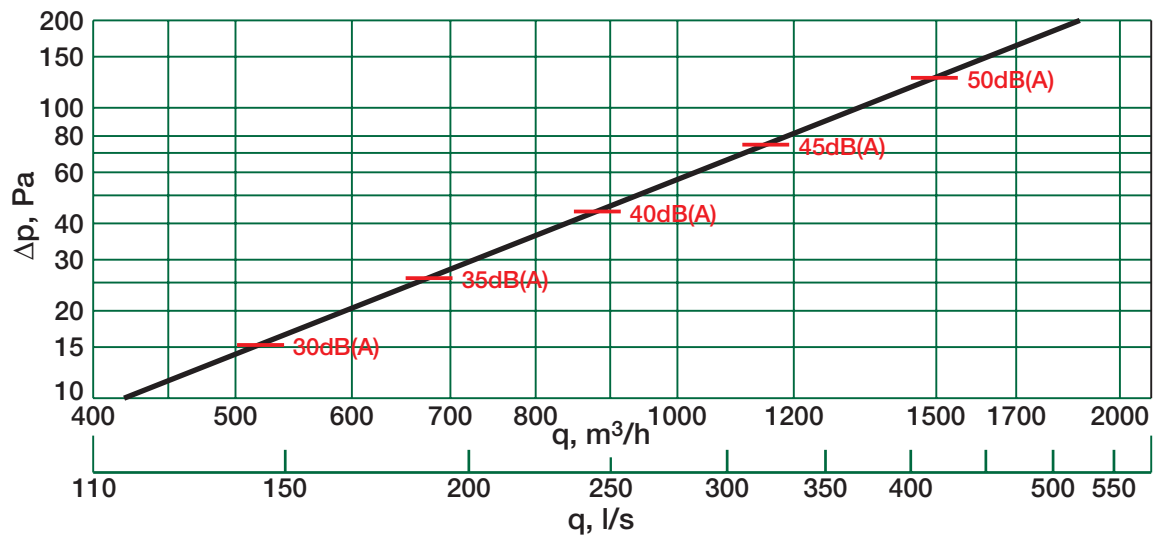
SDZ-315 – throw for cooling function



Max temperature difference for cooling: $\Delta t \leq -12$ K.

Air flow, pressure drop, sound level

SDZ-315 – air flow, pressure drop and sound level

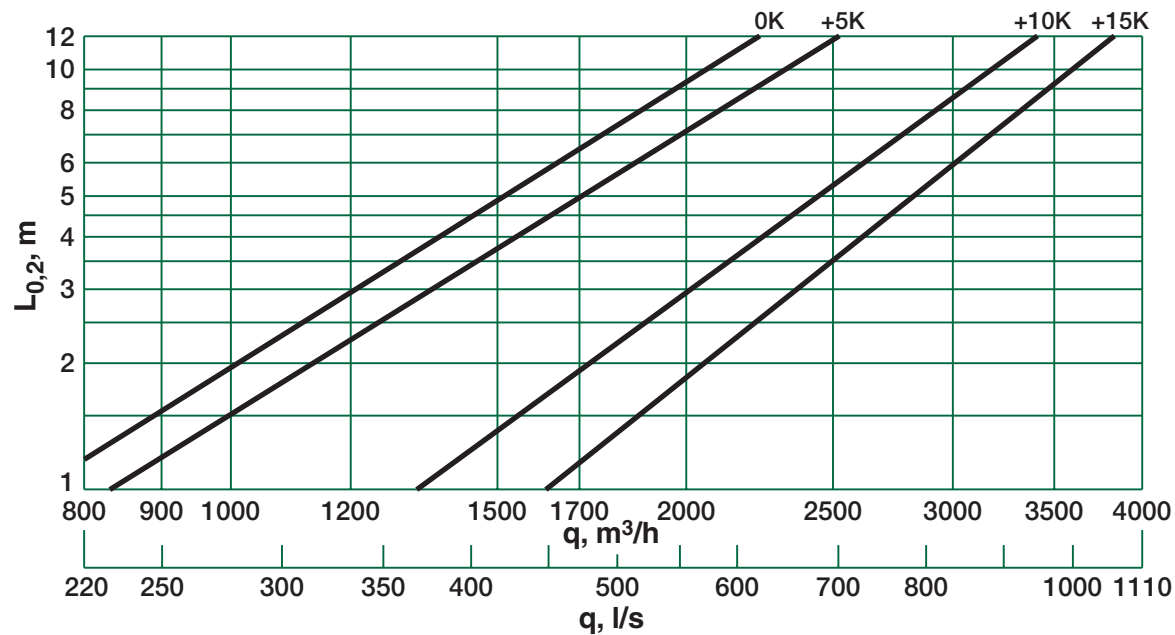


In the above graph, the sound levels in dB(A) are indicated for a reference room with 10 m² room absorption, equivalent to 4 dB room attenuation.

The graph shows capacity data for a diffuser with a fully open centre outlet. For a diffuser with a closed centre outlet, the sound level read in the graph must be increased by 4 dB.

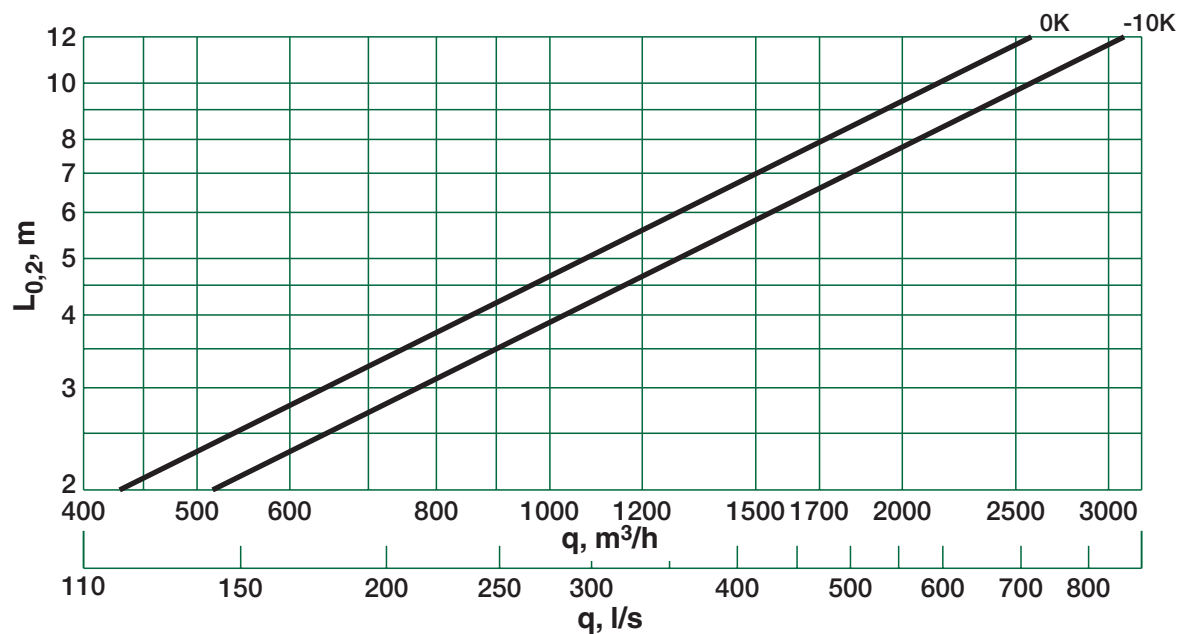
Throw

SDZ-400 – throw for heating function



Max temperature difference for heating: $\Delta t \leq +15$ K.

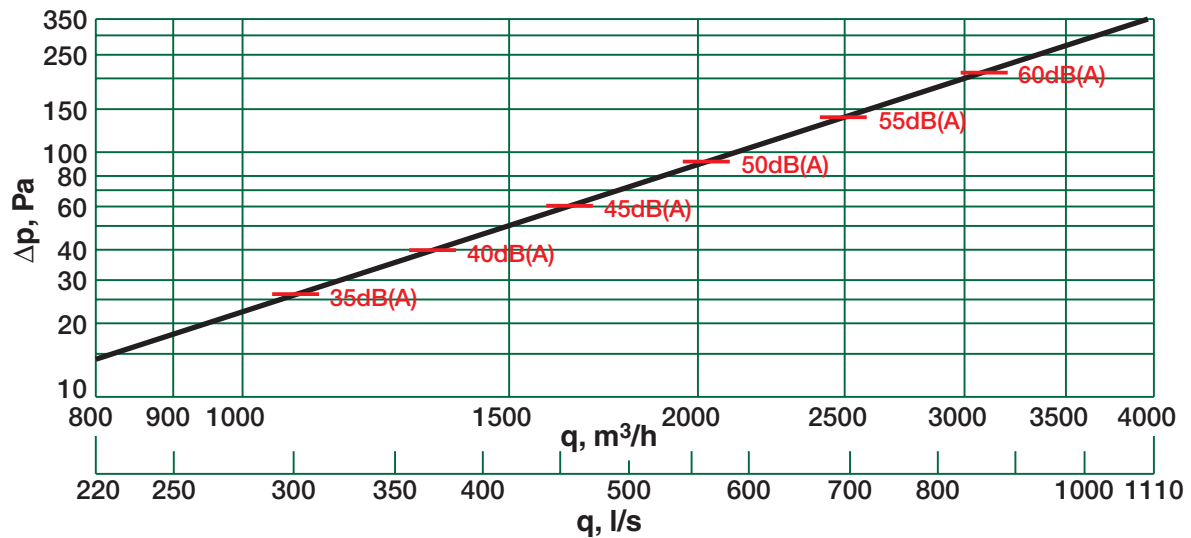
SDZ-400 – throw for cooling function



Max temperature difference for cooling: $\Delta t \leq -12$ K.

Air flow, pressure drop, sound level

SDZ-400 – air flow, pressure drop and sound level

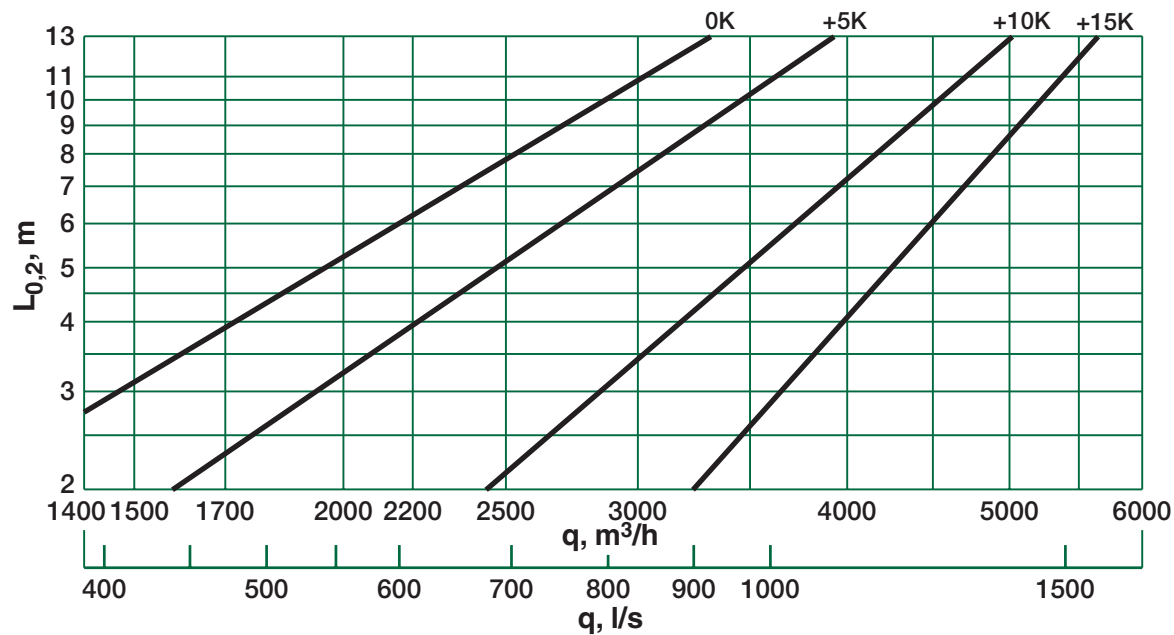


In the above graph, the sound levels in dB(A) are indicated for a reference room with 10 m² room absorption, equivalent to 4 dB room attenuation.

The graph shows capacity data for a diffuser with a fully open centre outlet. For a diffuser with a closed centre outlet, the sound level read in the graph must be increased by 4 dB.

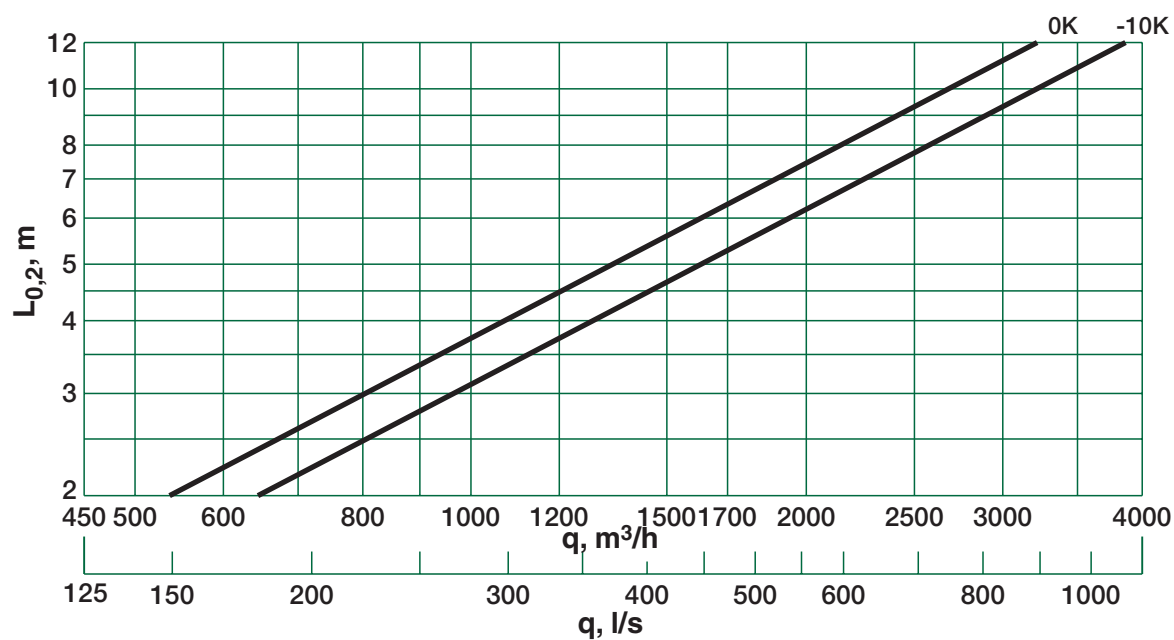
Throw

SDZ-500 – throw heating function



Max temperature difference for heating: $\Delta t \leq +15$ K.

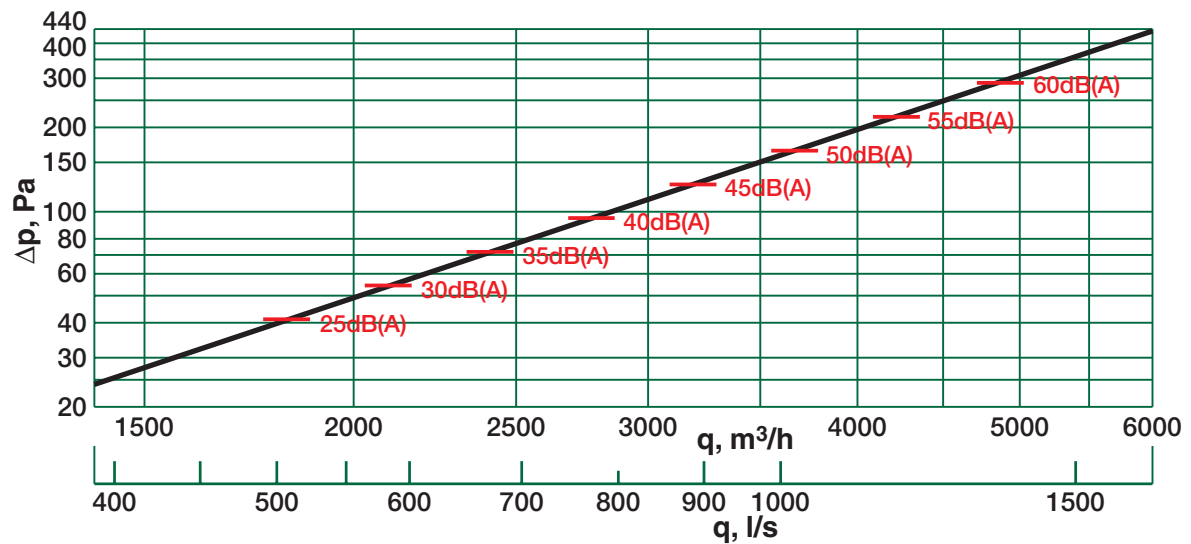
SDZ-500 – throw cooling function



Max temperature difference for cooling: $\Delta t \leq -12$ K.

Air flow, pressure drop, sound level

SDZ-500 – air flow, pressure drop and sound level

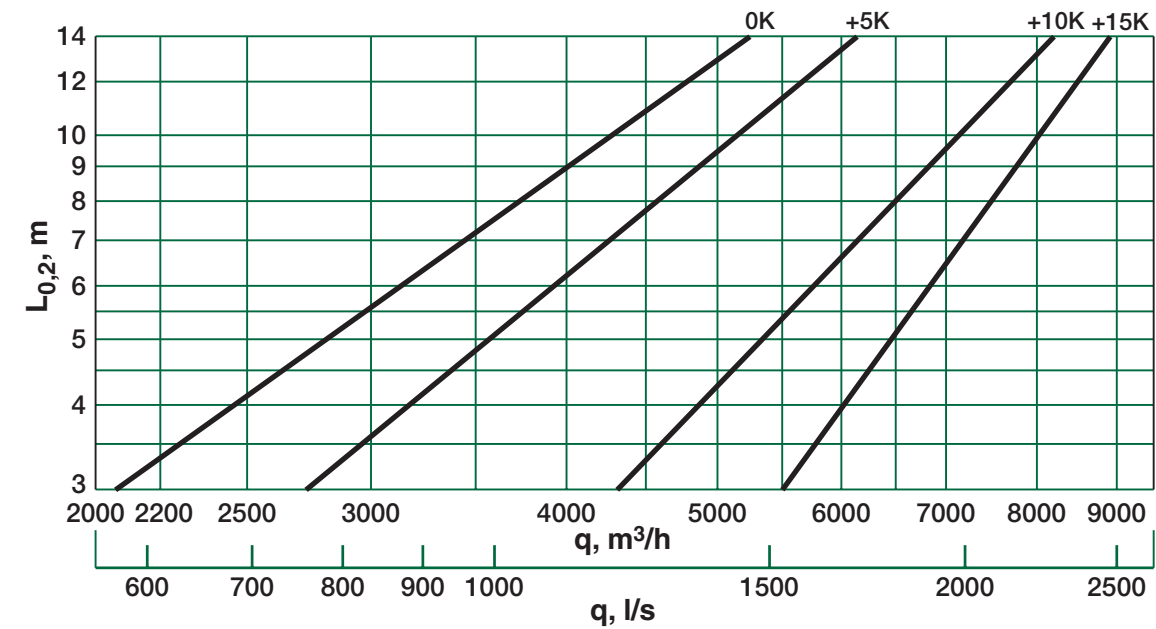


In the above graph, the sound levels in dB(A) are indicated for a reference room with 10 m² room absorption, equivalent to 4 dB room attenuation.

The graph shows capacity data for a diffuser with a fully open centre outlet. For a diffuser with a closed centre outlet, the sound level read in the graph must be increased by 4 dB.

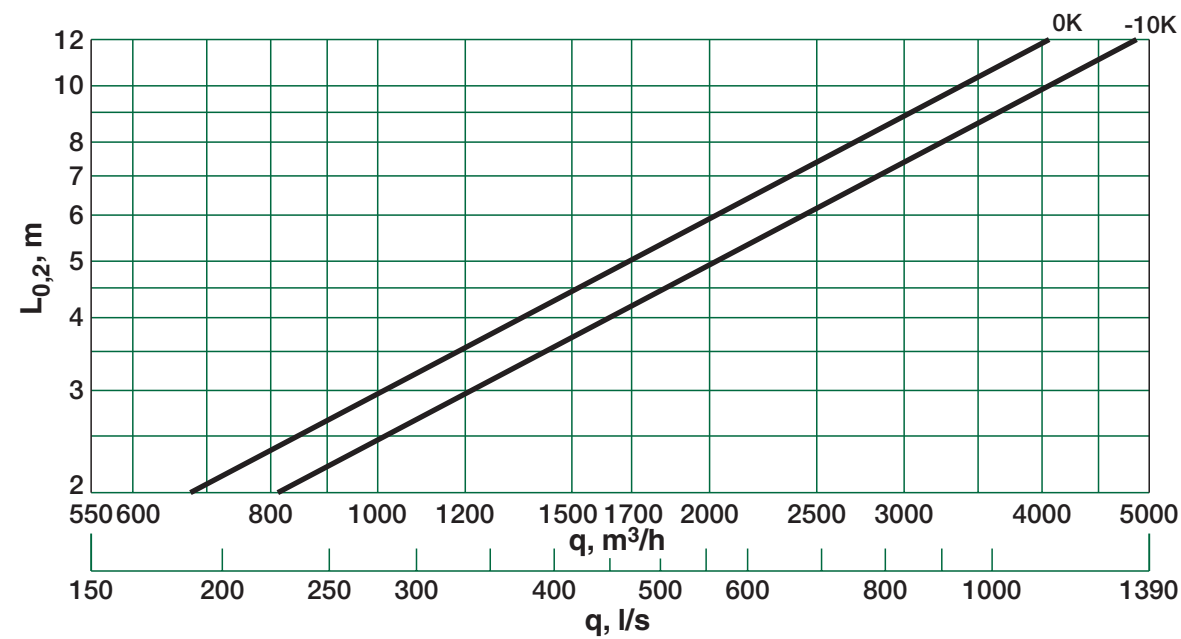
Throw

SDZ-630 – throw for heating function



Max temperature difference for heating: $\Delta t \leq +15$ K.

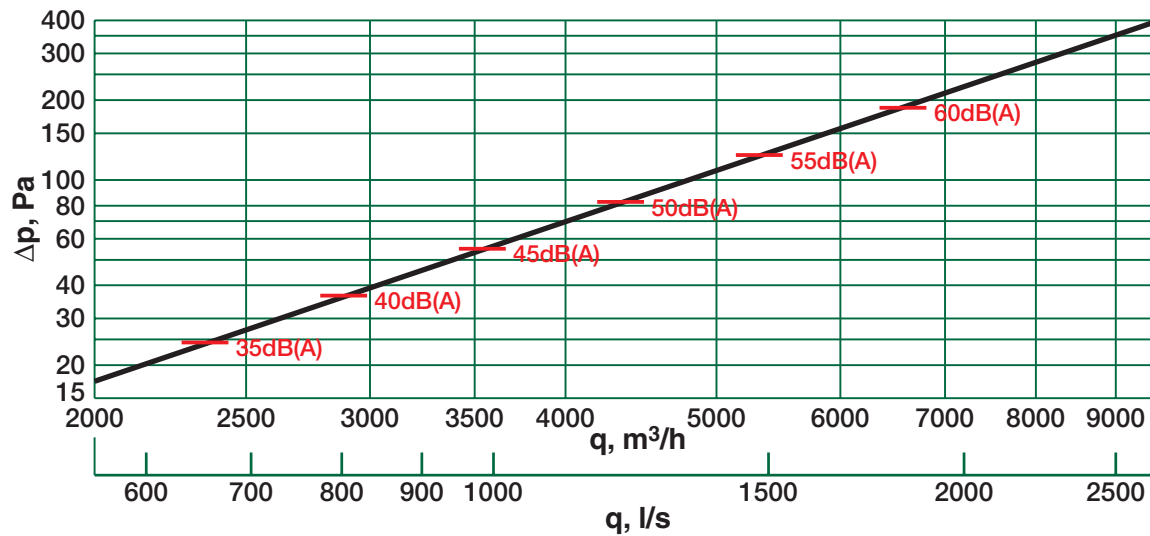
SDZ-630 – throw for cooling function



Max temperature difference for cooling: $\Delta t \leq -12$ K.

Air flow, pressure drop, sound level

SDZ-630 – air flow, pressure drop and sound level

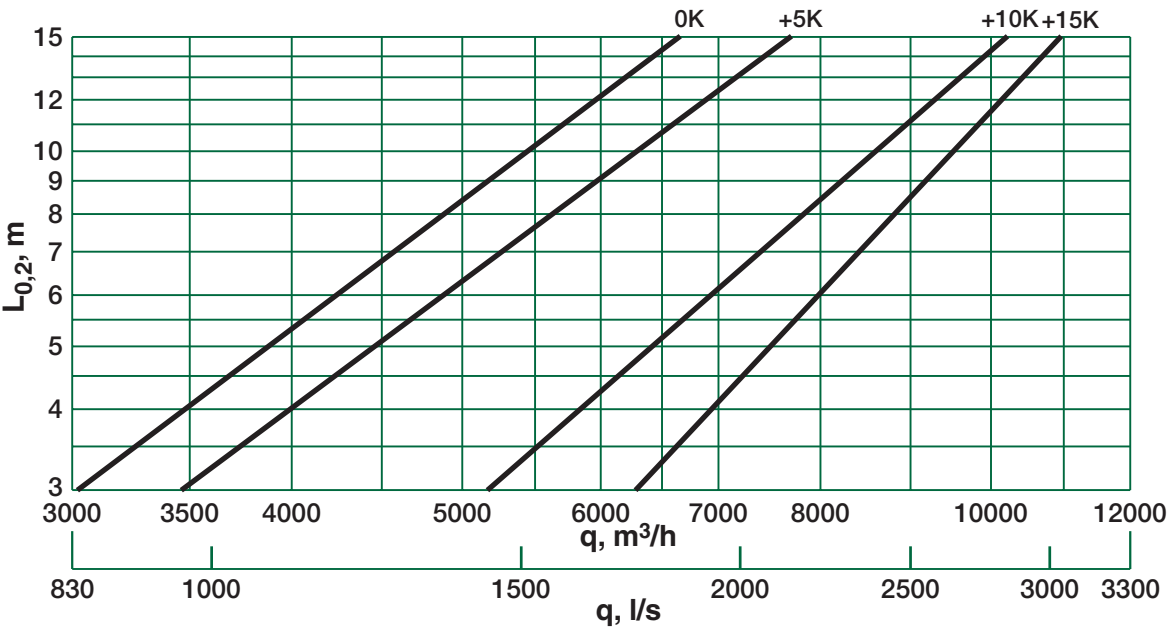


In the above graph, the sound levels in dB(A) are indicated for a reference room with 10 m² room absorption, equivalent to 4 dB room attenuation.

The graph shows capacity data for a diffuser with a fully open centre outlet. For a diffuser with a closed centre outlet, the sound level read in the graph must be increased by 4 dB.

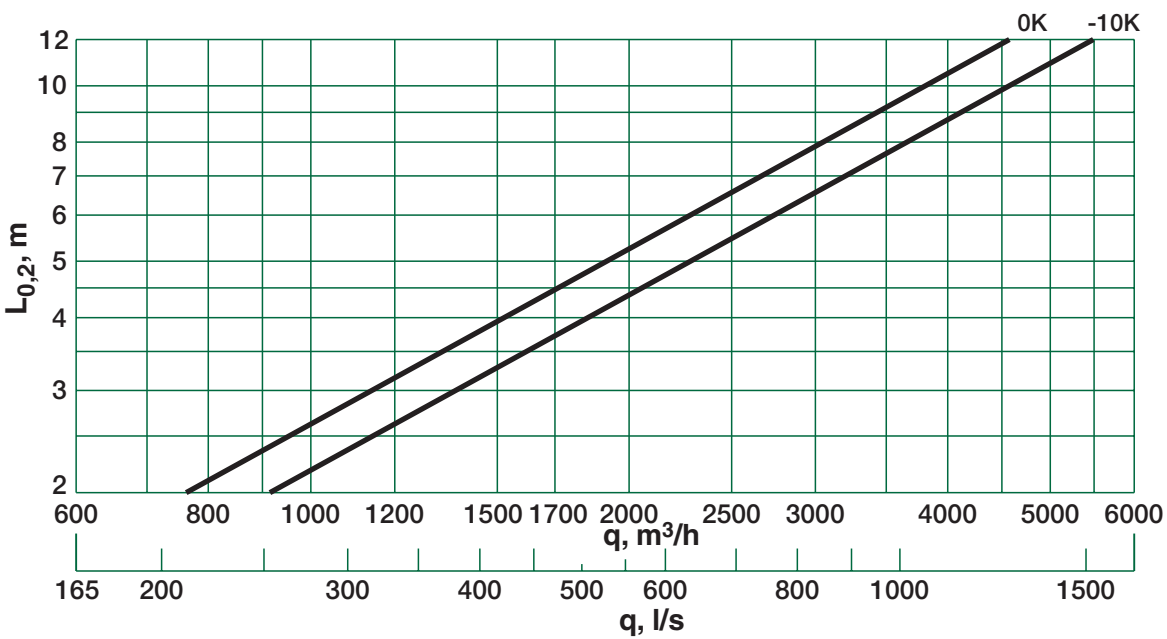
Throw

SDZ-710 – throw for heating function



Max temperature difference for heating: $\Delta t \leq +15$ K.

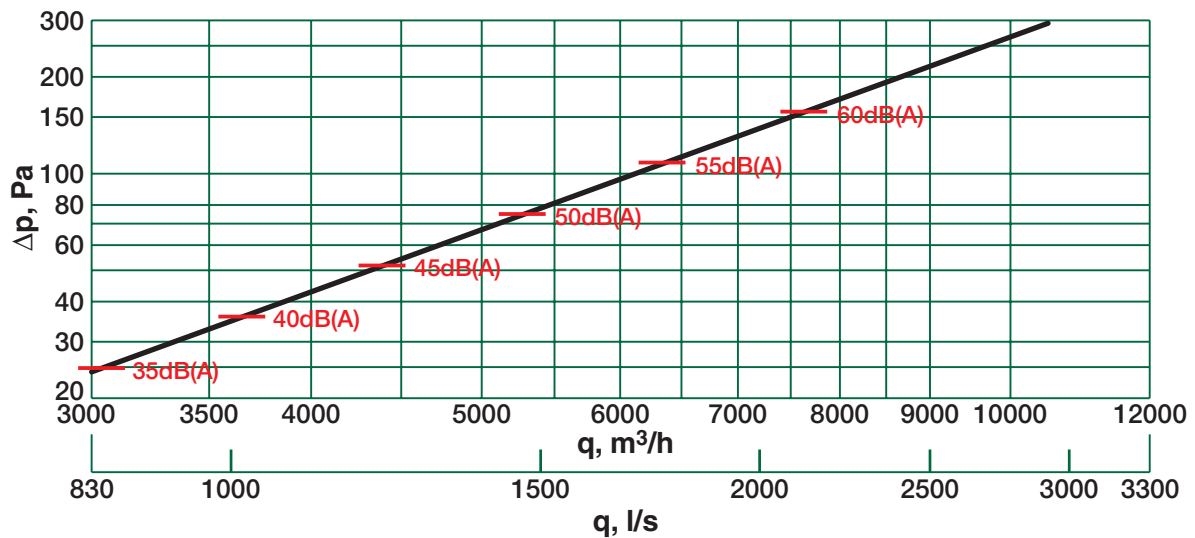
SDZ-710 – throw for cooling function



Max temperature difference for cooling: $\Delta t \leq -12$ K.

Air flow, pressure drop, sound level

SDZ-710 – air flow, pressure drop and sound level

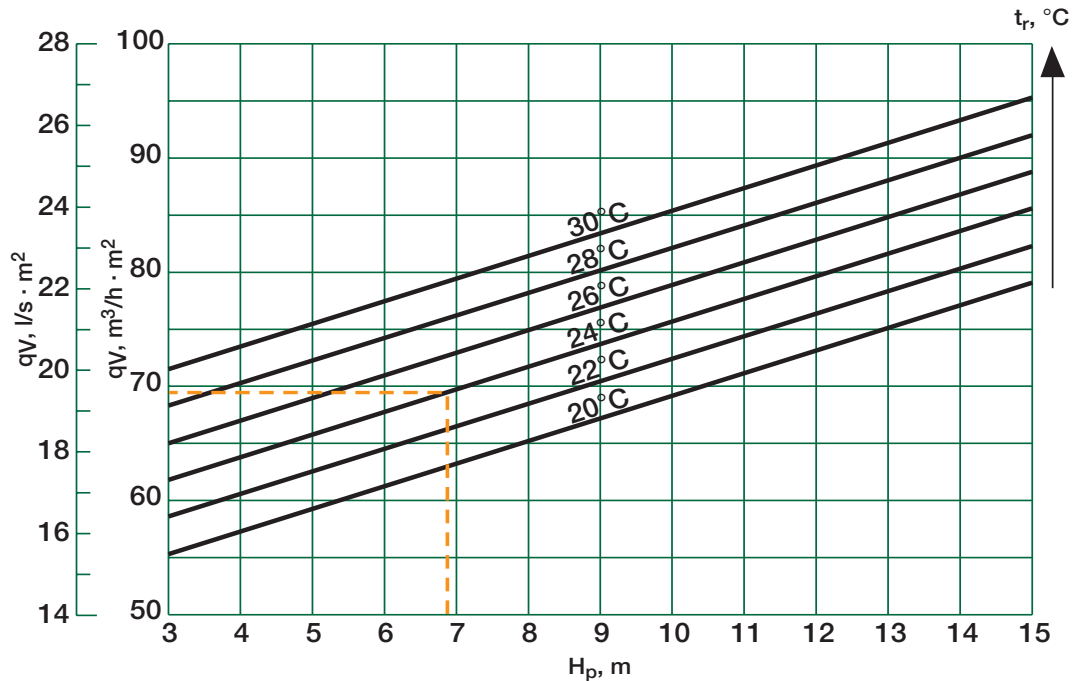


In the above graph, the sound levels in dB(A) are indicated for a reference room with 10 m² room absorption, equivalent to 4 dB room attenuation.

The graph shows capacity data for a diffuser with a fully open centre outlet. For a diffuser with a closed centre outlet, the sound level read in the graph must be increased by 4 dB.

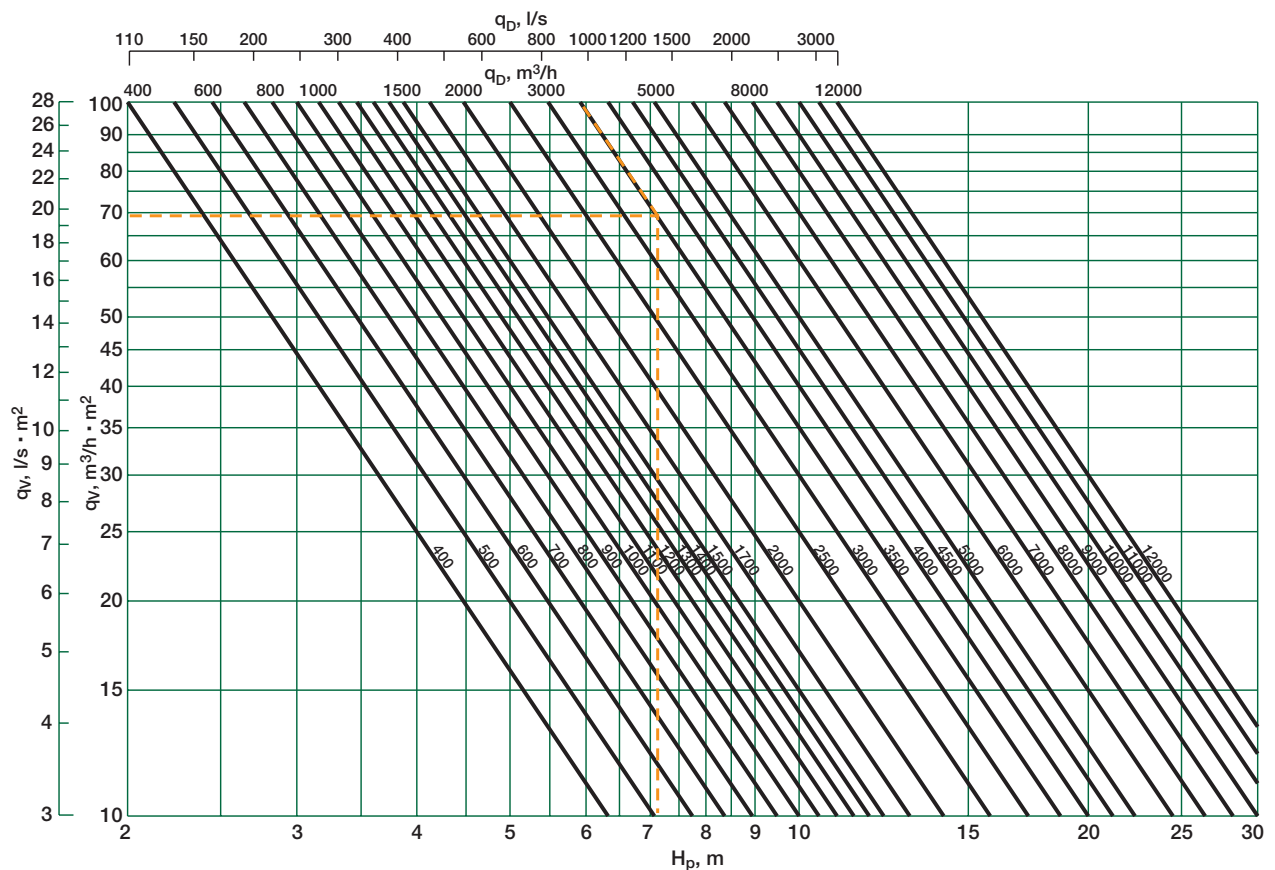
Volume air flow, min distance between diffusers

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.

Min distance between diffusers



Project design example

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 diffuser	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 $q_{\text{tot}} = 42\,000 \text{ m}^3/\text{h}$
 Served floor area, $A = 2000 \text{ m}^2$
 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 SDZ-500

Assumed number of diffusers, n	12 pc
Diffuser air flow, q_D	$3\,500 \text{ m}^3/\text{h}$
Throw, $L_{0.2}$ (from graph)	5.1 m
Installation height above the floor, H_p	$5.1 + 1.8 = 6.9 \text{ m}$
Estimated Δt_v for heating	+10 K
Min air flow taken from the graph for the diffuser heating function	$3\,500 \text{ m}^3/\text{h}$
Assumed distance between diffusers, t	12.5 m
Volume air flow, q_V (from graph)	$22.5 \text{ m}^3/\text{h} \times \text{m}^2$
Max volume air flow, for $H_p = 6.9 \text{ m}$ och $t_r = 24^{\circ}\text{C}$	$69 \text{ m}^3/\text{h} \times \text{m}^2$
Min distance between diffusers, t_{min} where $q_{V\text{max}} = 69 \text{ m}^3/\text{h} \times \text{m}^2$ is not exceeded	7.2 m

2. Choice of diffuser, size SDZ-315

Assumed number of diffusers, n	24 pc
Diffuser air flow, q_D	$1\,750 \text{ m}^3/\text{h}$
Throw, $L_{0.2}$ (from graph)	6.6 m
Installation height above the floor, H_p	$6.6 + 1.8 = 8.4 \text{ m}$
Estimated Δt_v for heating	+10 K
Min air flow taken from the graph for the diffuser heating function	$1\,750 \text{ m}^3/\text{h}$
Assumed distance between diffusers, t	8.5 m
Volume air flow, q_V (from graph)	$26.0 \text{ m}^3/\text{h} \times \text{m}^2$
Max volume air flow, for $H_p = 8.4 \text{ m}$ and $t_r = 24^{\circ}\text{C}$	$72 \text{ m}^3/\text{h} \times \text{m}^2$
Min distance between diffusers, t_{min} where $q_{V\text{max}} = 72 \text{ m}^3/\text{h} \times \text{m}^2$ is not exceeded	4.9 m

Sound data, dimensions and weights, diffusion patterns

Definitions

q	air flow	l/s, m ³ /h
Δp_t	total pressure drop	Pa
L ₀₂	throw	m
L _{A10}	sound pressure level with a room attenuation of 4 dB (10 m ² room absorption area)	dB(A)
L _W	sound power level	dB
K _{ok}	octave band correction	dB

Sound power level

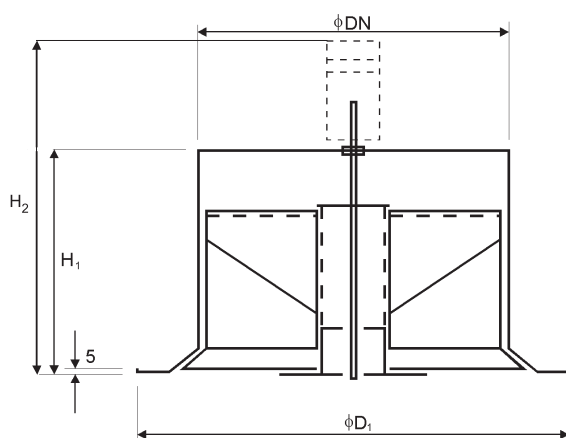
SDZ	Correction of noise level K _{ok} in dB for octave bands, mean frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
315	6	1	0	-2	-6	-11	-15	-23
400	4	0	-2	-4	-7	-11	-16	-26
500	3	-1	-1	-2	-5	-7	-14	-25
630	3	0	-2	-3	-5	-9	-13	-24
710	2	0	-2	-3	-6	-11	-13	-26

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 SDZ.

Dimensions and weights



Size	ØDN	ØD ₁	H ₁	H ₂	weight, kg
315	315	470	240	360	4.0
400	400	650	260	380	5.5
500	500	770	300	420	7.5
630	630	940	440	540	9.0
710	710	1240	470	545	11.0

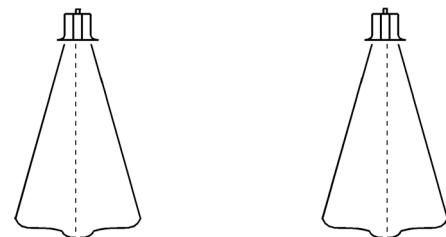
Diffusion patterns

Cooling function $\Delta t_k = -12$ K

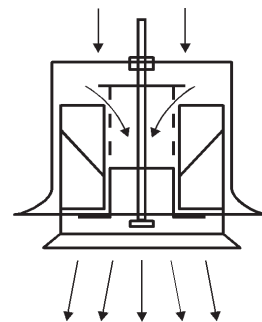


Air diffusion pattern with inner diffuser outlet and outer diffuser outlet fully closed.

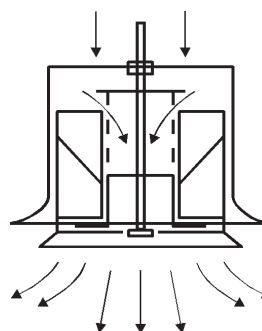
Heating function $\Delta t_v = +15$ K



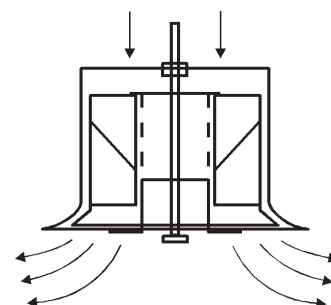
Air diffusion pattern with inner diffuser outlet and outer diffuser outlet fully open.



Vertical flow



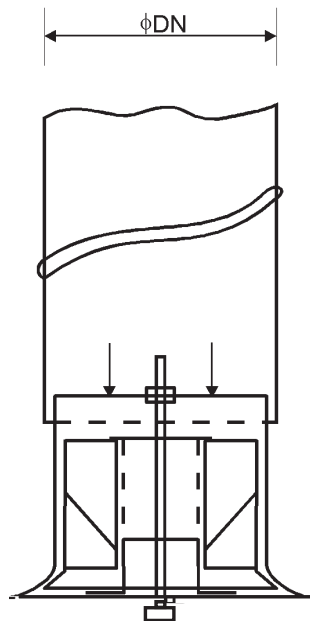
Combined flow



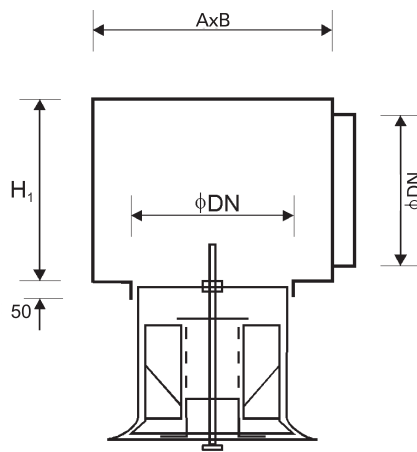
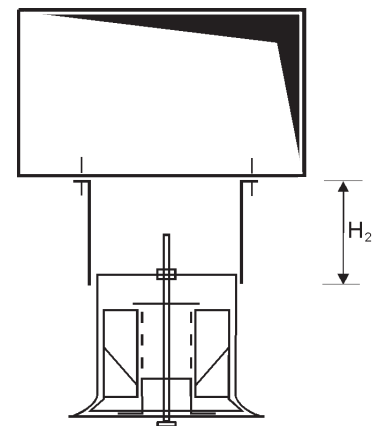
Horizontal (radial) flow

Installation example

Installation example



Direct connection to duct

Connection with connection box¹⁾

Connection to the duct with extension take-off piece

Installation dimensions

Size SDZ (ϕDN)	A	B	H_1	H_2	$\phi D1$
315	480	380	375	250	314
400	570	470	470	320	399
500	680	550	550	400	498
630	780	680	540	480	628
710	900	900	900	480	708

- ¹⁾ The connection box is normally provided with a measurement socket used to measure the total pressure, of which the size makes it possible to determine the diffuser capacity with the help of the graph. The connection box can also be provided with internal acoustic insulation and/or a measurement and balancing damper, which is installed in the connection duct of the box.

Descriptive text, product codes

Descriptive text

Swirl air diffuser SDZ with long reach for ceiling installation with/without connection box SKR manufactured by Fläkt Woods in size, e.g. 400 with manual/electric regulation of air direction and throw.

Product codes

Swirl diffuser

SDZ-aaa-b-c

Size

315, 400, 500, 630, 710

Regulation

1 = manual adjustment

2 = Belimo motor on/off

3 = Belimo motor linear

4 = Siemens motor on/off

5 = Siemens motor linear

Colour of the diffuser (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 RAL-code)

Connection box

SKR-aaa-b-c-d

Size (matching diffuser SDZ)

315, 400, 500, 630, 710

Type

0 = uninsulated

1 = insulated

Damper

0 = without

1 = with a blade damper

Connection tube

1 = with rubber sealing (except the size 710)