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Adjustable swirl diffuser SDZA

TECHNICAL DATA

Adjustable ceiling swirl diffuser SDZA is intended for commercial and industrial buildings with a large room volume and high ceiling interiors, for example market halls, warehouses, factories etc.
The function of the diffuser can be adapted to both summer and winter conditions. The air diffusion pattern is varied by opening or closing the inner centre outlet and by changing the position of the outer outlet. The maximum vertical throw length of 15 m is achieved when the inner centre outlet is fully open and the outer diffuser outlet is withdrawn.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 horizontal diffusion pattern is obtained.
Swirl diffuser SDZA has an air flow range of between 125 and 3056 l/s (450 - 11 000 m^3/h) and has a vertical throw of between 3 and 15 m.
SDZA can be adjusted manually or with the help of an electric actuator.

QUICK SELECTION

Size	Air flow		Installation height H_p, m	Pressure drop Pa
	l/s	m^3/h		
SDZA-31	125-556	450-2000	3-8	12-220
SDZA-40	278-1056	1000-3800	3-12	35-300
SDZA-50	417-1528	1500-5500	4-13	40-350
SDZA-63	694-2500	2500-9000	5-14	30-350
SDZA-71	972-3056	3500-11000	5-15	45-300

SPECIFICATIONS

- Available in 5 sizes, connections from 315 to 710 mm
- Installation with connection box or directly to the duct
- Adjustable air diffusion pattern
- Controlled manually or via electric actuator

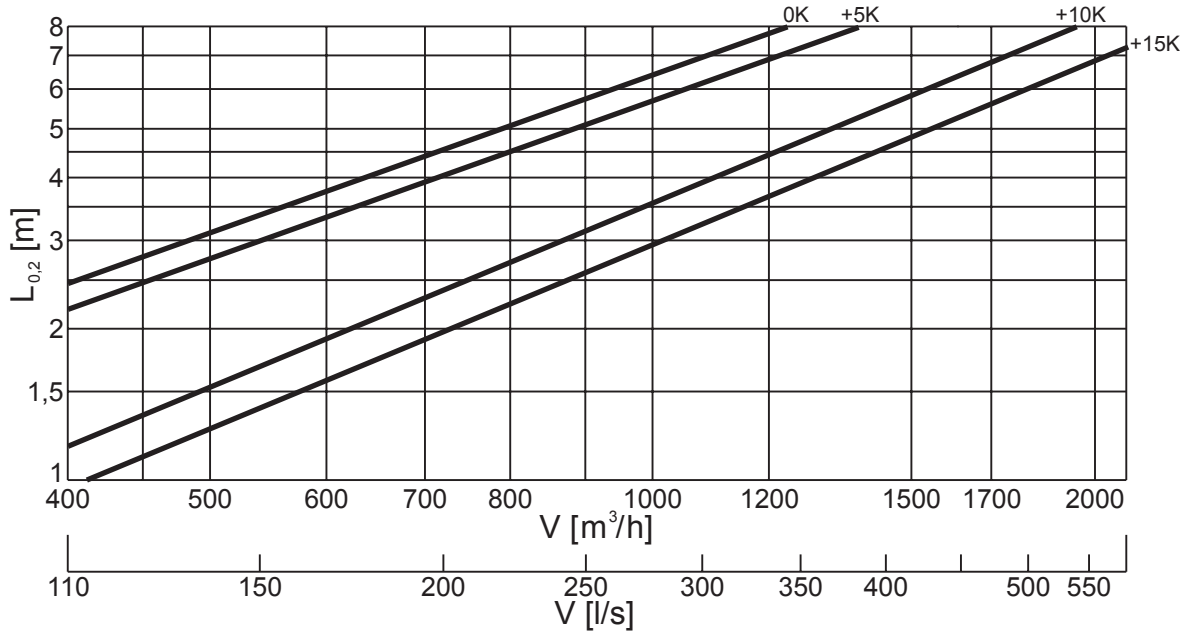
PRODUCT CODE EXAMPLE

Swirl diffuser SDZA-50-3-1
Terminal of size 50 adjustable by linear electric actuator, painted in RAL 9010 colour.

Connection box SKKA-50-50-1-0
Duct connection diameter of 500 mm, diffuser size 50, insulated, without damper.

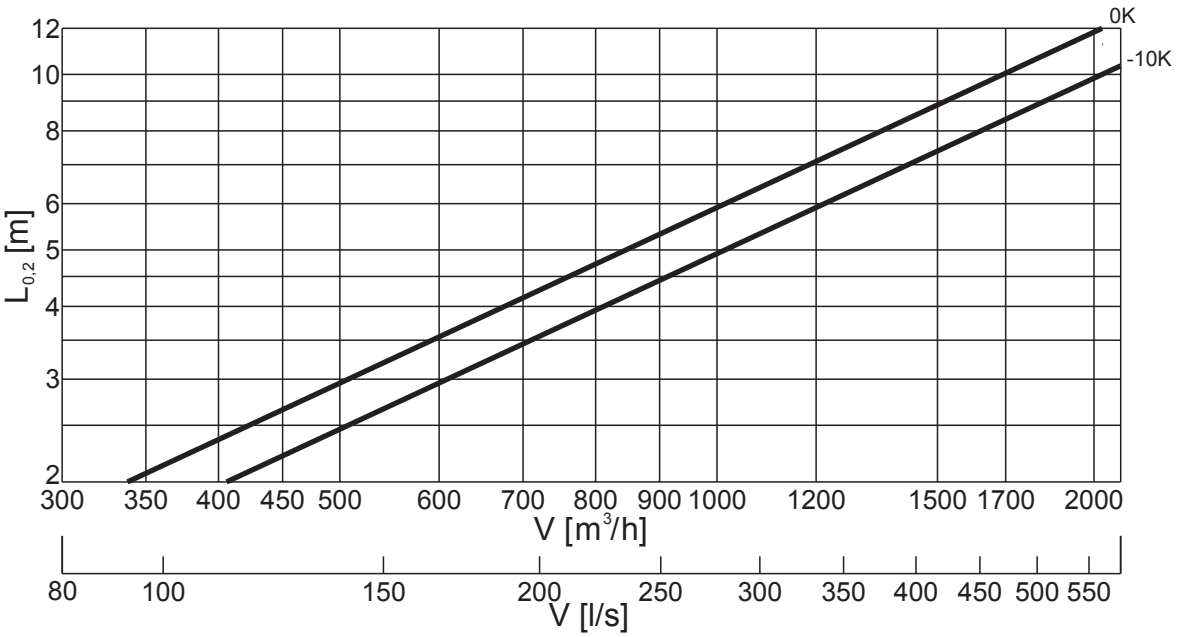
THROW LENGTH

SDZA-31 – THROW LENGTH FOR HEATING FUNCTION (VERTICAL DIFFUSION PATTERN)



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

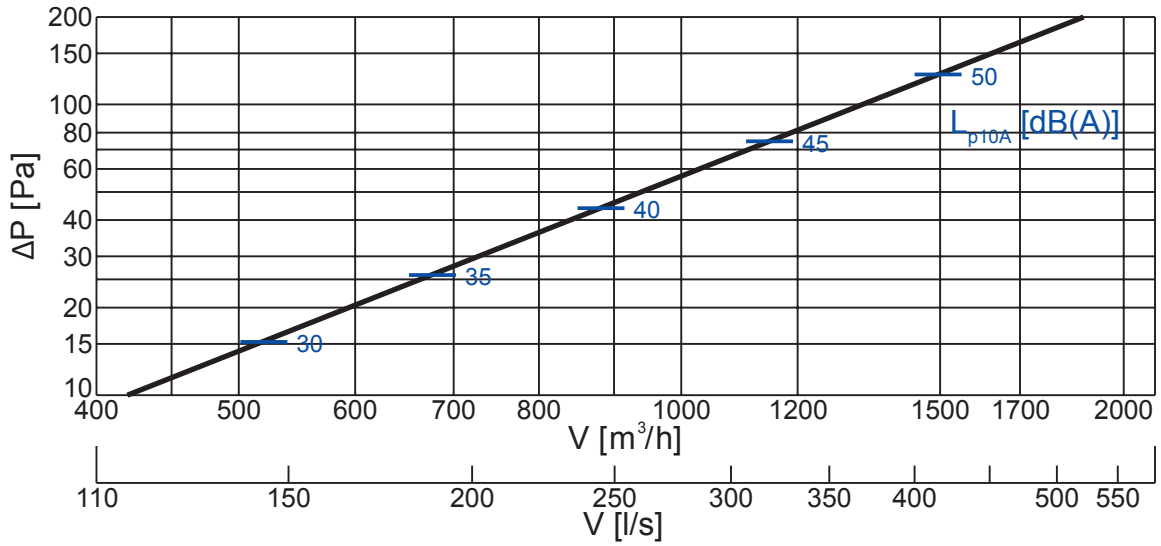
SDZA-31 – THROW LENGTH FOR COOLING FUNCTION (HORIZONTAL DIFFUSION PATTERN)



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

AIR FLOW, PRESSURE DROP, SOUND LEVEL

SDZA-31 – AIR FLOW, PRESSURE DROP AND SOUND LEVEL

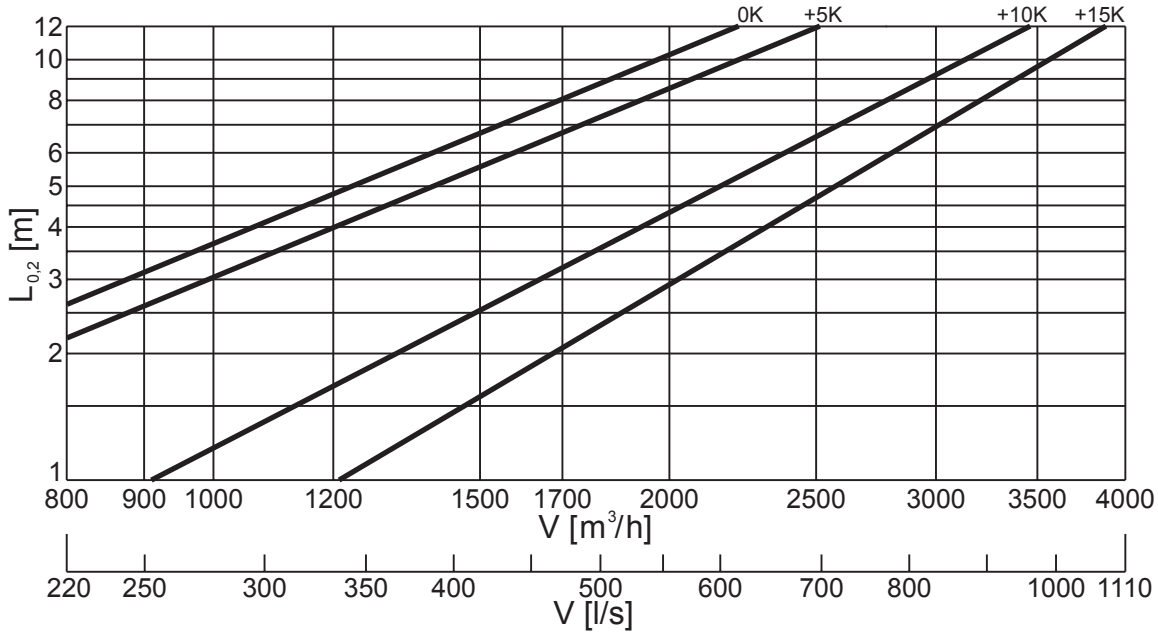


In the above graph, the sound pressure levels in dB(A) are indicated for a reference room with 10 m^2 Sabine room absorption, equivalent to 4 dB room attenuation.

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.

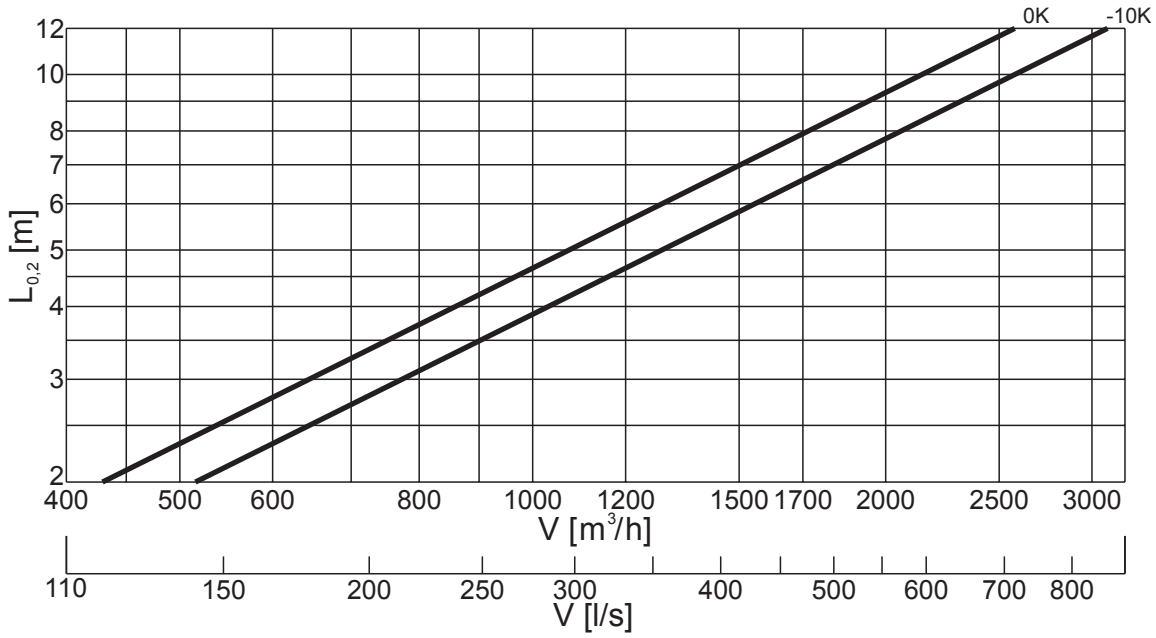
THROW LENGTH

SDZA-40 – THROW LENGTH FOR HEATING FUNCTION (VERTICAL DIFFUSION PATTERN)



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

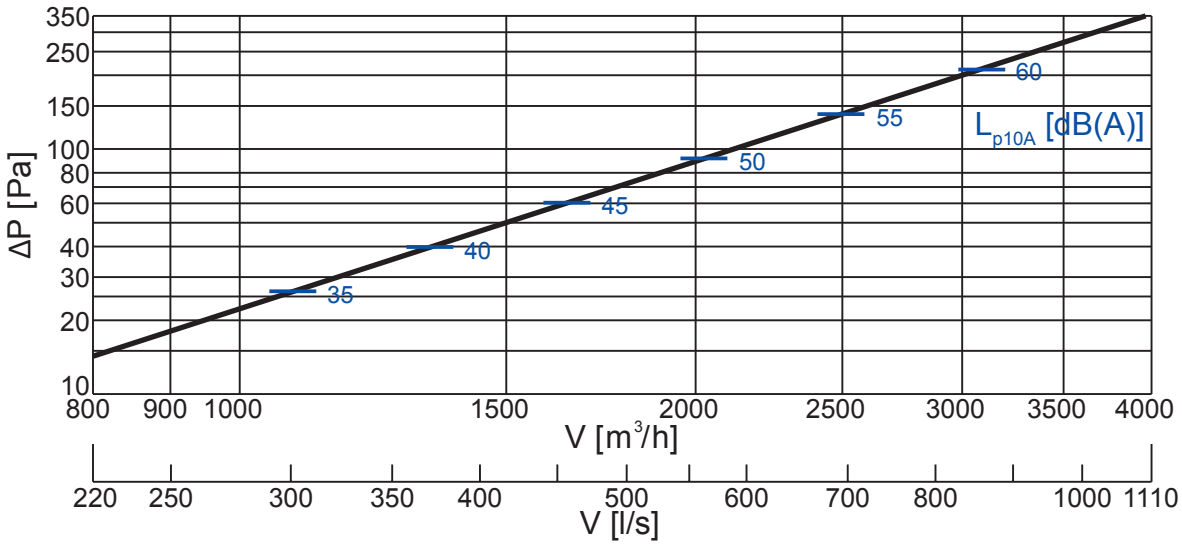
SDZA-40 – THROW LENGTH FOR COOLING FUNCTION (HORIZONTAL DIFFUSION PATTERN)



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

AIR FLOW, PRESSURE DROP, SOUND LEVEL

SDZA-40 – AIR FLOW, PRESSURE DROP AND SOUND LEVEL

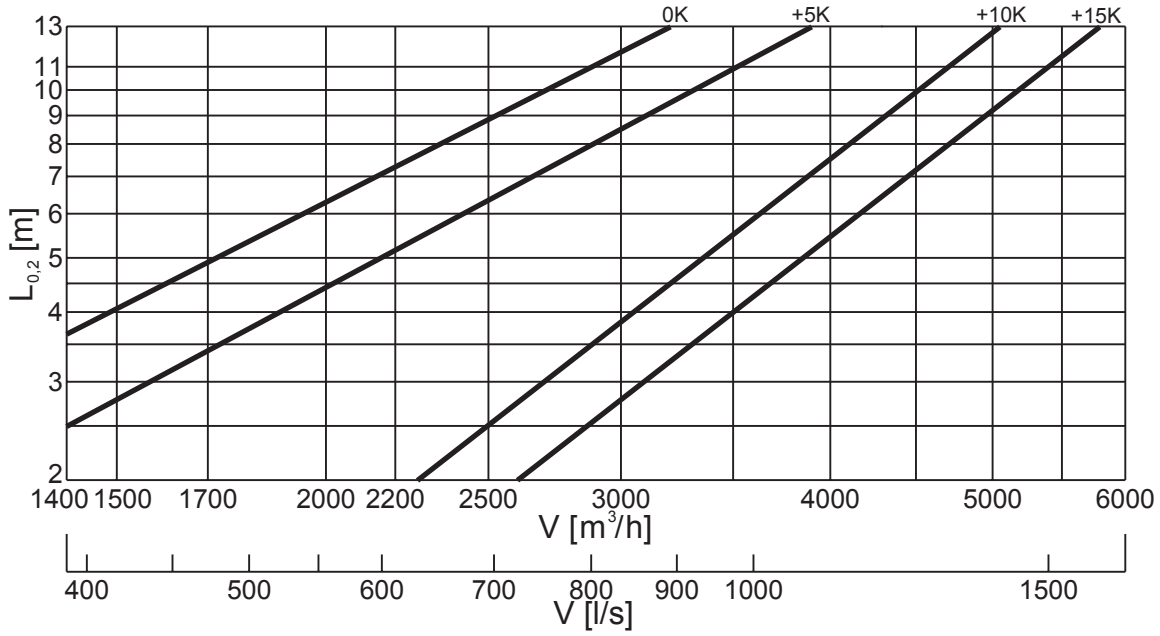


In the above graph, the sound pressure levels in dB(A) are indicated for a reference room with 10 m^2 Sabine room absorption, equivalent to 4 dB room attenuation.

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.

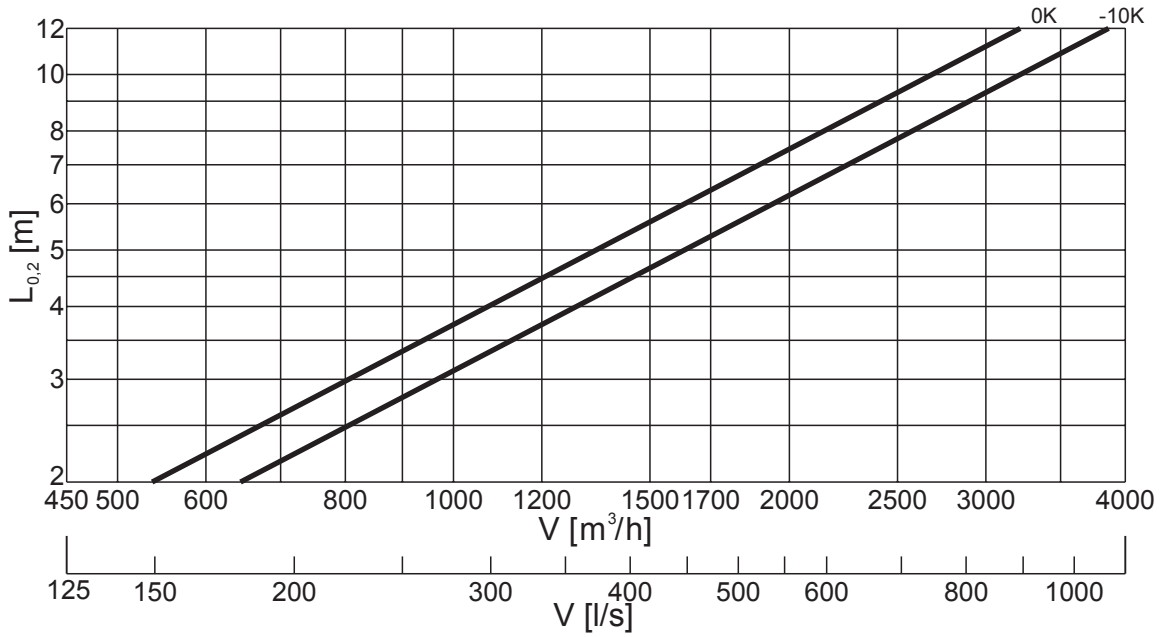
THROW LENGTH

SDZA-50 – THROW LENGTH FOR HEATING FUNCTION (VERTICAL DIFFUSION PATTERN)



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

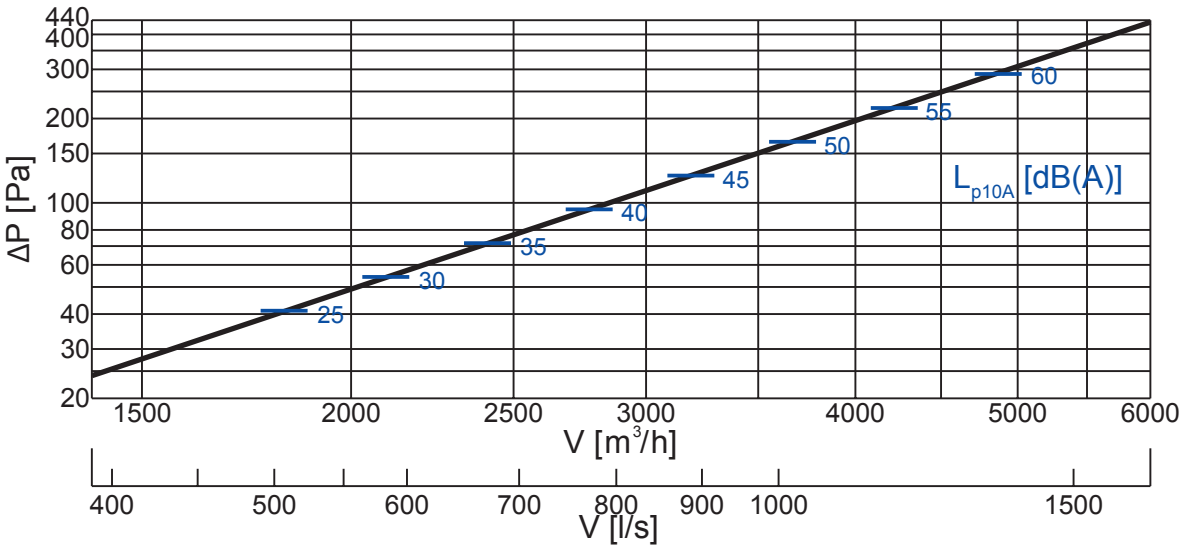
SDZA-50 – THROW LENGTH FOR COOLING FUNCTION (HORIZONTAL DIFFUSION PATTERN)



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

AIR FLOW, PRESSURE DROP, SOUND LEVEL

SDZA-50 – AIR FLOW, PRESSURE DROP AND SOUND LEVEL

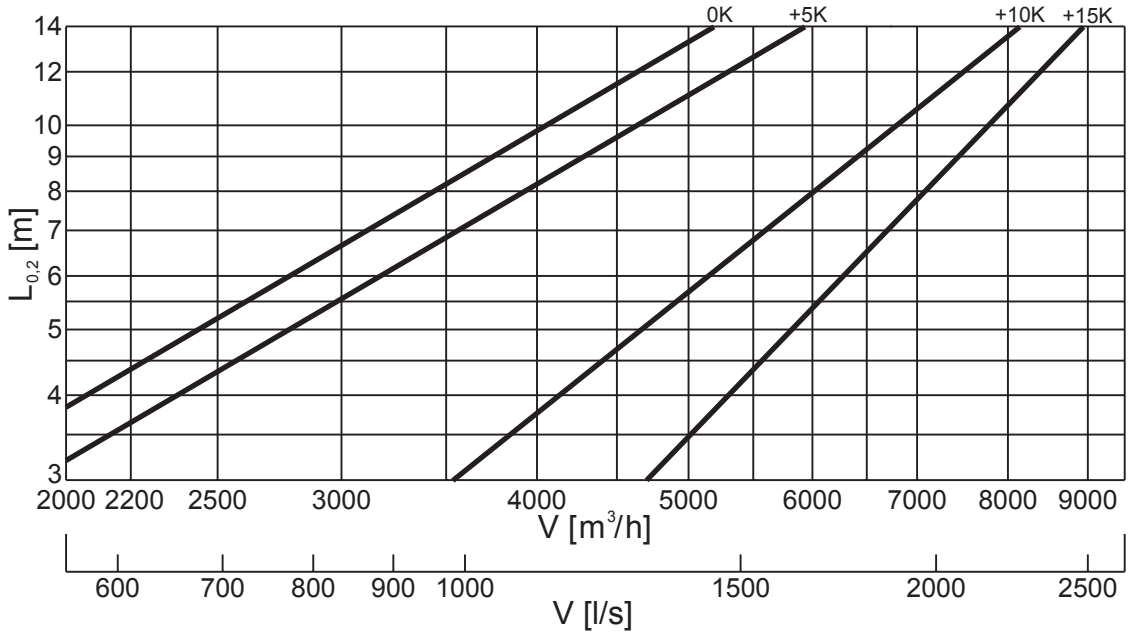


In the above graph, the sound pressure levels in dB(A) are indicated for a reference room with 10 m² Sabine room absorption, equivalent to 4 dB room attenuation.

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.

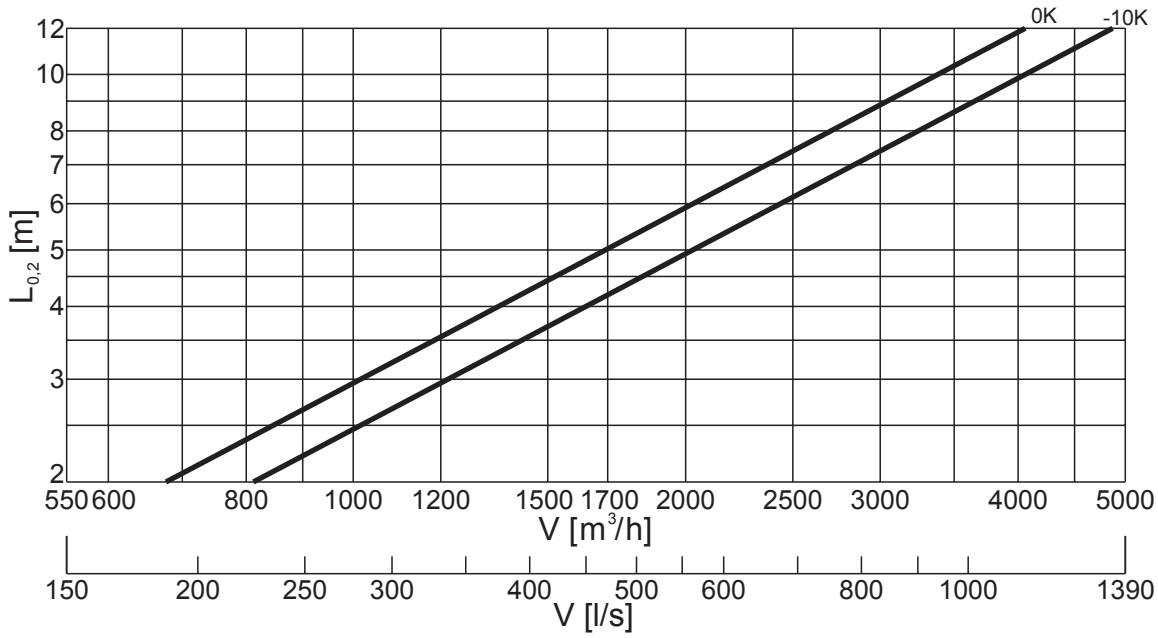
THROW LENGTH

SDZA-63 – THROW LENGTH FOR HEATING FUNCTION (VERTICAL DIFFUSION PATTERN)



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

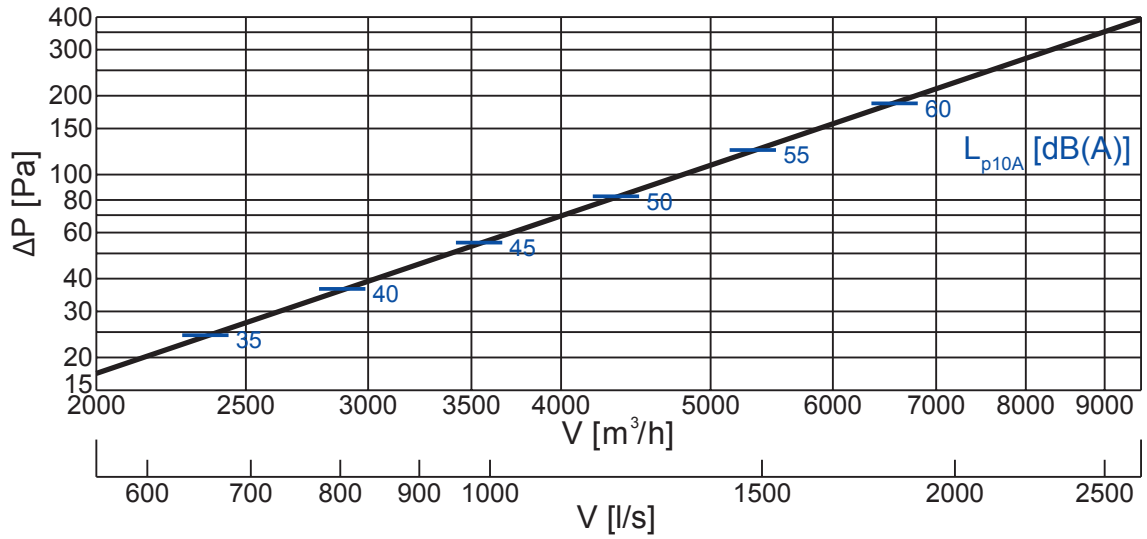
SDZA-63 – THROW LENGTH FOR COOLING FUNCTION (HORIZONTAL DIFFUSION PATTERN)



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

AIR FLOW, PRESSURE DROP, SOUND LEVEL

SDZA-63 – AIR FLOW, PRESSURE DROP AND SOUND LEVEL

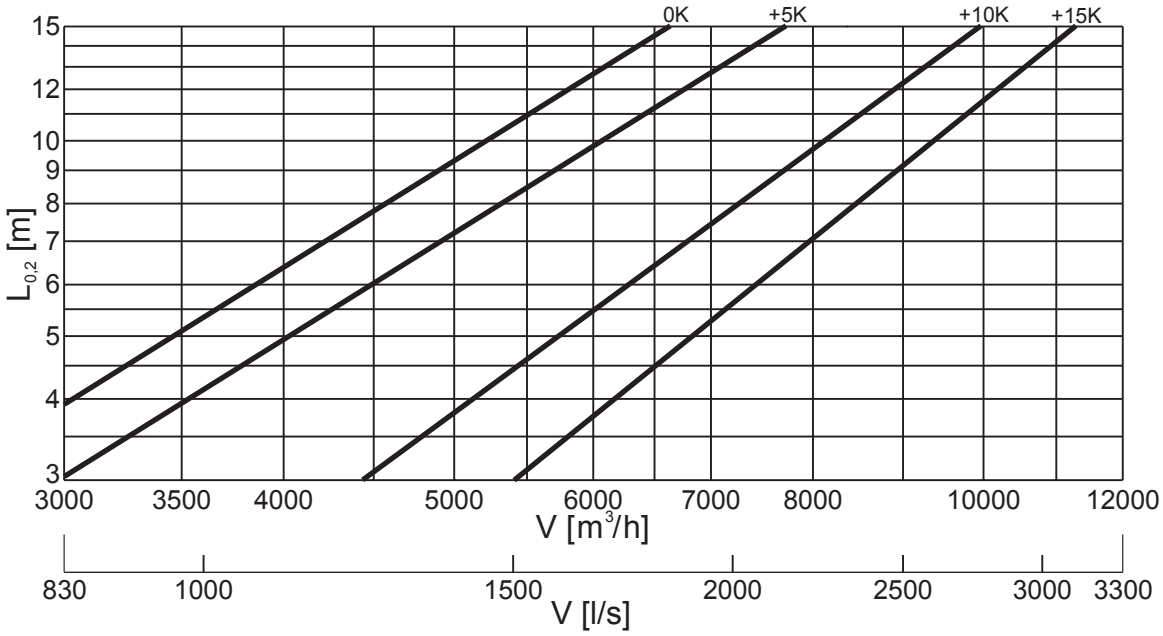


In the above graph, the sound pressure levels in dB(A) are indicated for a reference room with 10 m^2 Sabine room absorption, equivalent to 4 dB room attenuation.

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.

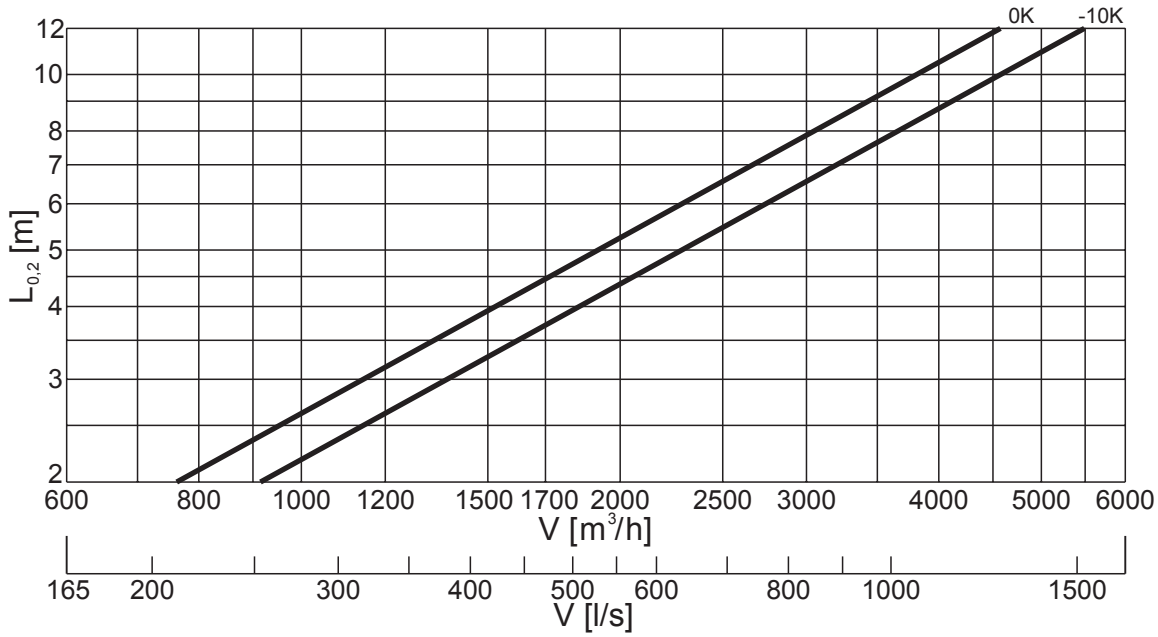
THROW LENGTH

SDZA-71 – THROW LENGTH FOR HEATING FUNCTION (VERTICAL DIFFUSION PATTERN)



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

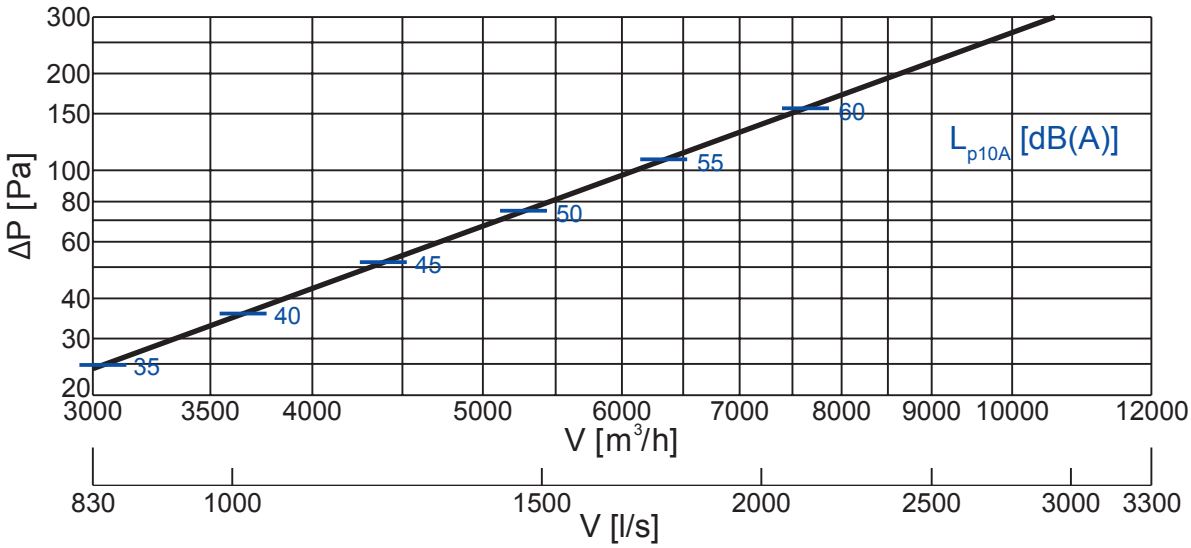
SDZA-71 – THROW LENGTH FOR COOLING FUNCTION (HORIZONTAL DIFFUSION PATTERN)



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

AIR FLOW, PRESSURE DROP, SOUND LEVEL

SDZA-71 – AIR FLOW, PRESSURE DROP AND SOUND LEVEL

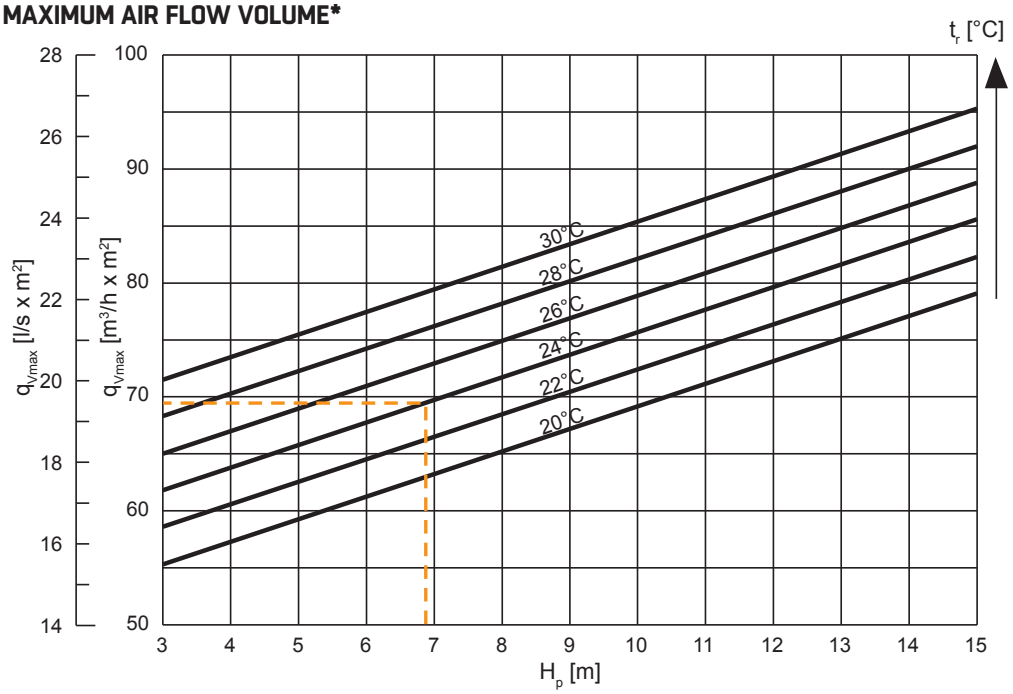


In the above graph, the sound levels pressure in dB(A) are indicated for a reference room with 10 m^2 Sabine room absorption, equivalent to 4 dB room attenuation.

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.

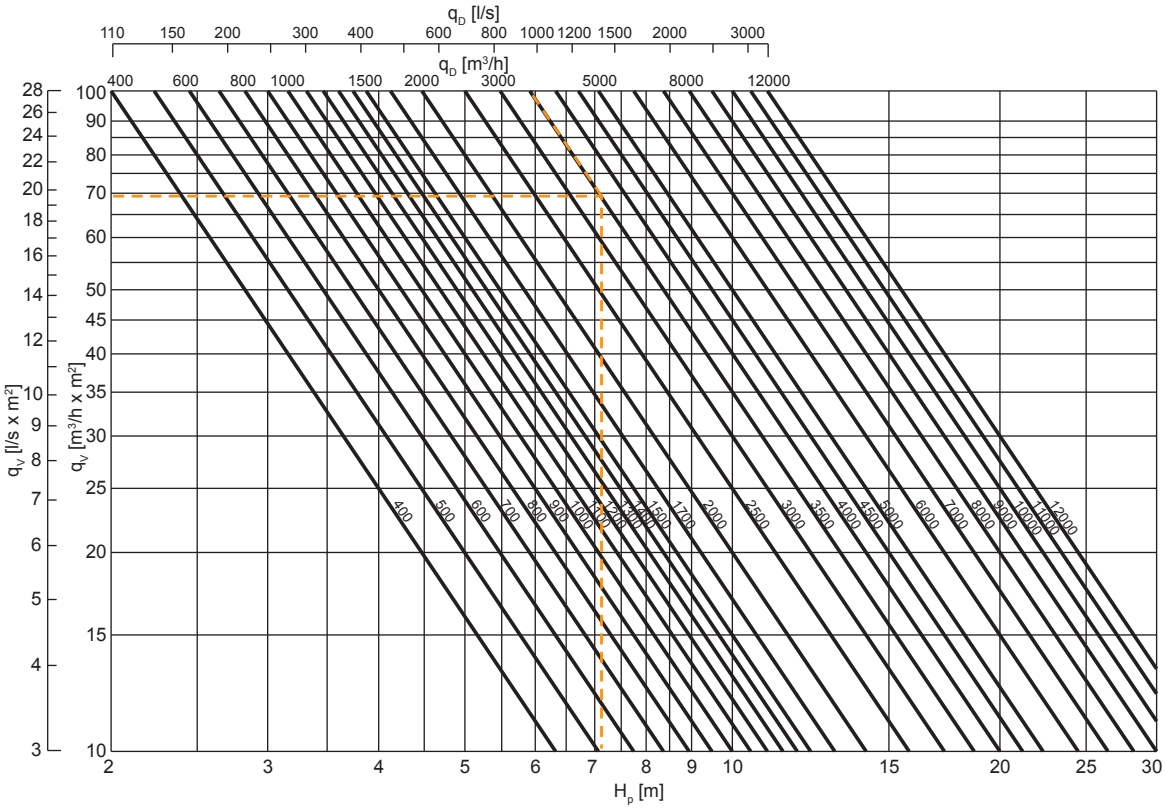
AIR FLOW VOLUME, DISTANCE BETWEEN DIFFUSERS

MAXIMUM AIR FLOW VOLUME*



*Assuming that average metabolic activity level is 2.0 met and clothing insulation is 0.5 – 0.6 clo. Premises which meet these conditions are e.g. sport halls, warehouses and light industry halls.

MINIMUM 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	$m^3/h \times m^2$
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	°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_{tot} = 42 000 m^3/h
Served floor area A = 2000 m^2
Room temperature t_r = 24°C
Supply air temperature t_s = 34° C
Required throw length $L_{0.2}$ = 5 m
Installation height above the floor $H_p = L_{0.2} + H_W$
Height of occupied zone H_W = 1.8 m

1. Selection of diffuser, size SDZA-50

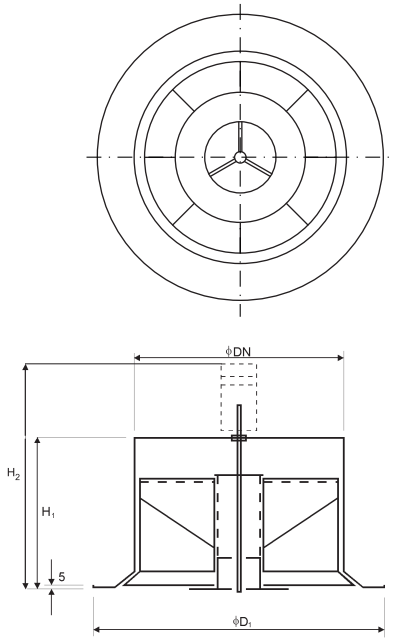
Assumed number of diffusers, n	12 pcs.
Diffuser air flow, q_D	3 500 m^3/h
Assumed Δt_v for heating	+10 K
Min air flow taken from the graph for the diffuser heating function	3365 m^3/h
Assumed distance between diffusers, t	12.5 m
Volume air flow, q_V (from graph)	21.9 $m^3/h \times m^2$
Max volume air flow, for H_p = 6.8 m and t_r = 24°C	69 $m^3/h \times m^2$
Min distance between diffusers, t_{min} where q_{Vmax} = 71 $m^3/h \times m^2$ is not exceeded	7.2 m

2. Selection of diffuser, size SDZA-31

Assumed number of diffusers, n	24 pcs.
Diffuser air flow, q_D	1 750 m^3/h
Assumed Δt_v for heating	+10 K
Min air flow taken from the graph for the diffuser heating function	1 310 m^3/h
Assumed distance between diffusers, t	8.3 m
Volume air flow, q_V (from graph)	18.7 $m^3/h \times m^2$
Max volume air flow, for H_p = 6,8 m and t_r = 24°C	69 $m^3/h \times m^2$
Min distance between diffusers, t_{min} where q_{Vmax} = 71 $m^3/h \times m^2$ is not exceeded	4.3 m

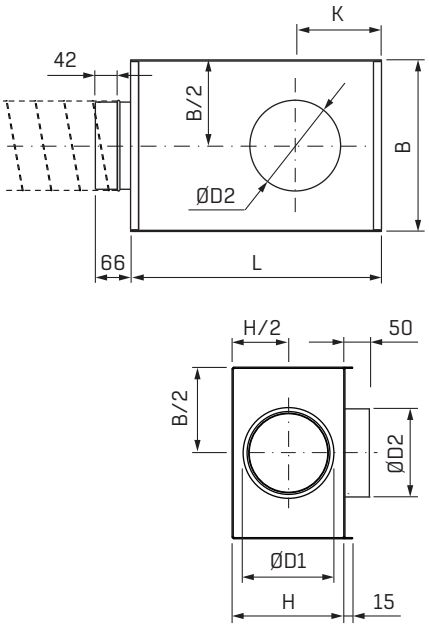
DIMENSIONS AND WEIGHT

SDZA SUPPLY AIR DIFFUSER



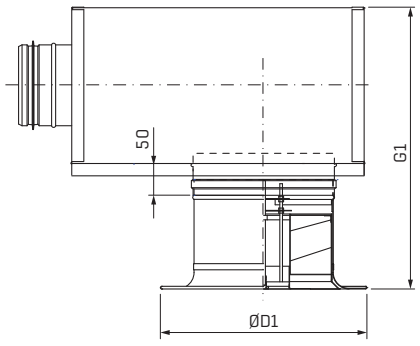
Size	ØDN (mm)	ØD1 (mm)	H1 (mm)	H2 (mm)	Weight (kg)
31	314	466	245	445	6.8 - 7.6
40	397	625	256	456	7.4 - 8.0
50	497	765	317	517	11.6 - 13.0
63	628	932	469	669	17.7 - 19.0
71	708	1240	515	715	31.0 - 32.5

SKKA PLENUM BOX



Size	ØD1 (mm)	ØD2 (mm)	H (mm)	L (mm)	B (mm)	K (mm)
31-31	315	315	360	700	570	310
40-40	400	400	455	700	570	300
50-50	500	500	555	700	570	350
63-63	630	630	685	800	800	400
71-71	710	710	885	950	950	475

SDZA DIFFUSER + SKKA PLENUM BOX



Size	ØD1 (mm)	G1 (mm)
31-31	466	620
40-40	625	726
50-50	765	887
63-63	932	1169
71-71	1240	1415

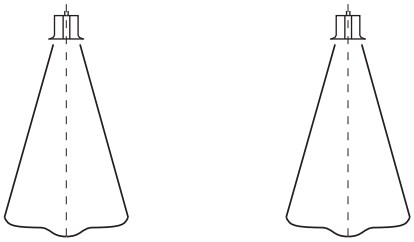
DIFFUSION PATTERN, ADJUSTMENT

DIFFUSION PATTERNS

Cooling function △t = -12K

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

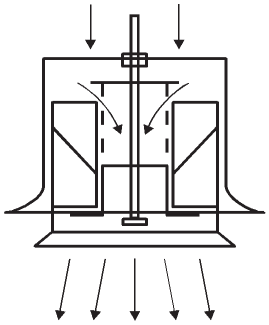
Heating function △t = +15K



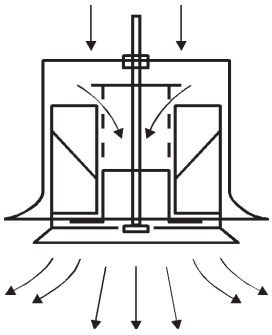
Air diffusion pattern with inner diffuser outlet and outer diffuser outlet fully open.

ADJUSTMENT

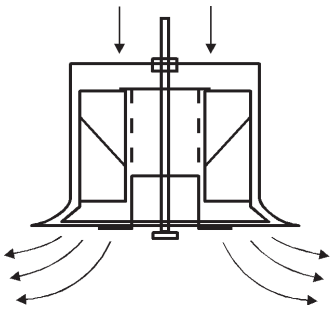
Vertical flow



Diagonal flow



Horizontal (radial) flow



ACOUSTICAL DATA, DEFINITIONS

SOUND POWER LEVEL

Size	Correction of sound level K_{oct} in dB for octave bands, mean frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
31	6	1	0	-2	-6	-11	-15	-23
40	4	0	-2	-4	-7	-11	-16	-26
50	3	-1	-1	-2	-5	-7	-14	-25
63	3	0	-2	-3	-5	-9	-13	-24
71	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_{p10A}, in dB(A), and the corrections K_{oct} for the octave bands in the table with the help of the following formula:

$L_W = L_{p10A} + K_{oct}$

Correction K_{oct} is the mean value for the range of application of SDZA.

DEFINITIONS

q	air flow	l/s, m^3/h
Δp_t	total pressure drop	Pa
L_{02}	throw	m
L_{p10A}	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_{oct}	octave band correction	dB

CONSTRUCTION AND FUNCTION

SDZA is an adjustable ceiling swirl diffuser that is recommended to be mounted with SKKA plenum box or directly to the duct. Its diffusion pattern can be changed from horizontal to vertical in order to adapt summer or winter conditions. Position of internal movable ring can be controlled manually or automatically via electric actuator. Perforated plate at the diffuser inlet equalizes the airflow.
SKKA connection box is available with or without sound attenuation material. In each plenum box, there are lugs attached to the walls for hanging purposes. SDZA is fixed to the box by screws.

MATERIAL AND SURFACE FINISH

Diffuser is made from steel and aluminium sheet. Plenum box is made from steel sheet. SDZA is powder-coated for a high surface finish. The standard colour is RAL 9010, 70% of gloss.
Sound attenuation lining is made of elastomeric foam based on synthetic rubber.
Electric actuators used in automatic version comply with RoHS directive.

INSTALLATION, ADJUSTMENT AND MAINTENANCE

The instructions for installation, adjustment and maintenance are available at www.flaktgroup.com

TECHNICAL DATA AND DIMENSIONING

For complete design details, please see the Fläktgroup product selection program SELECT. The program can be found on the Internet at www.flaktgroup.com.

SPECIFICATIONS TEXT EXAMPLE

The SDZA is a ceiling swirl diffuser that consists of external casing and internal movable parts, which position can be set due to actual demand in terms of diffusion pattern shape. Unit can be controlled manually or via electric actuators.
The SKKA plenum box includes effective sound attenuation elements.

PRODUCT CODE, ACCESSORIES

PRODUCT CODE

Adjustable swirl diffuser **SDZA-aa-b-c**

Size (aa)
31, 40, 50, 63, 71
Flow pattern regulation (b)
1 = manual adjustment
2 = with Belimo ON/OFF actuator
3 = with Belimo linear actuator
4 = with Siemens ON/OFF actuator
5 = with Siemens linear actuator
Colour (c)
1 = standard RAL 9010
X = any other colour from RAL palette

Connection box **SKKA-aa-bb-c-d**

Size (aa-bb)
31-31, 40-40, 50-50, 63-63, 71-71
(duct connection size - diffuser size)
Sound attenuation material (c)
0 = without
1 = with
Damper (d)
0 = without

ACCESSORIES

Damper **BDEP-1-bbb-c**

Size (bbb)
031-063
Model (c)
1 = standard

FläktGroup®

EXCELLENCE IN SOLUTIONS

FläktGroup is the European market leader for smart and energy efficient Indoor Air and Critical Air solutions to support every application area. We offer our customers innovative technologies, high quality and outstanding performance supported by more than a century of accumulated industry experience. The widest product range in the market, and strong market presence in 65 countries worldwide, guarantee that we are always by your side, ready to deliver Excellence in Solutions.

PRODUCT FUNCTIONS BY FLÄKTGROUP

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Air Management & ATD's | Air Conditioning & Heating | Controls | Service

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