FläktGroup®

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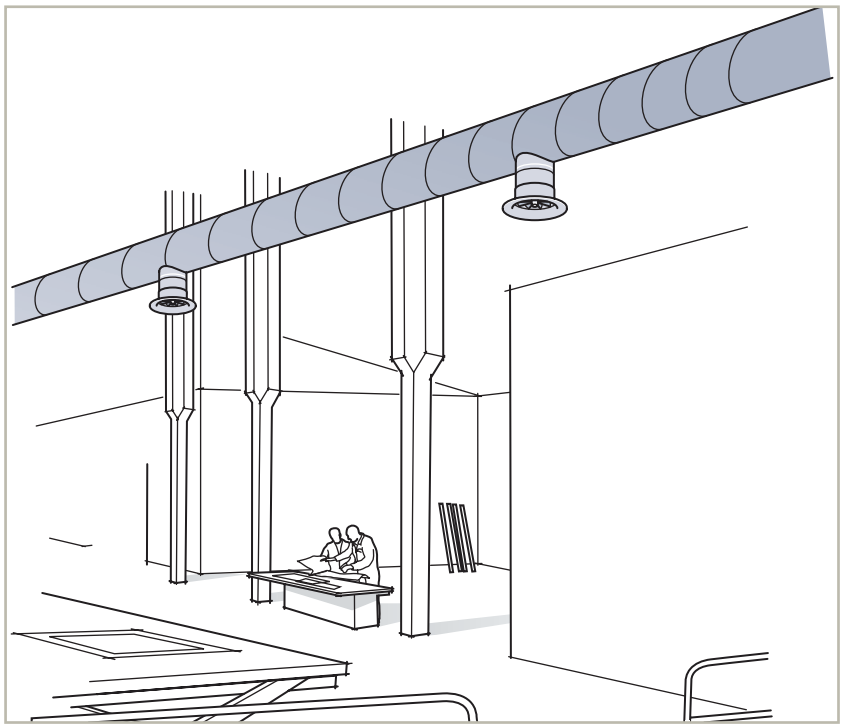
Adjustable swirl diffuser ODZA

TECHNICAL DATA



Adjustable ceiling swirl diffuser ODZA 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 controlled by changing the angle of the blades. Half of the blades are fixed as the rest can be rotated. At the end of movement they touch the fixed blade surface.
As a result of that, between the fixed and movable blades the holes are created and diffuser starts to work with "nozzle" effect. Thanks to that it can achieve very long vertical throw length.
Swirl diffuser ODZA has an air flow range of between 39 and 2500 l/s (140 - 9 000 m^3/h) and has an installation height between 3 and 28 m.
ODZA can be adjusted manually or with the help of an electric actuator or thermal element.

QUICK SELECTION

Size	Air flow		Installation height H_p, m	Pressure drop Pa
	l/s	m^3/h		
ODZA-25	39-389	140-1400	3-11	4-367
ODZA-31	56-556	200-2000	3-13	3-278
ODZA-40	153-1111	550-4000	3-20	8-428
ODZA-50	222-1667	800-6000	4-23	8-426
ODZA-63	361-2500	1300-9000	5-28	8-368

SPECIFICATIONS

- Available in 5 sizes, connections from 250 to 630 mm
- Installation directly to the duct or via SKKU connection box
- Continuous regulation of the throw direction from horizontal to vertical
- Manual or automatic control of diffusion pattern
- Long vertical throw length

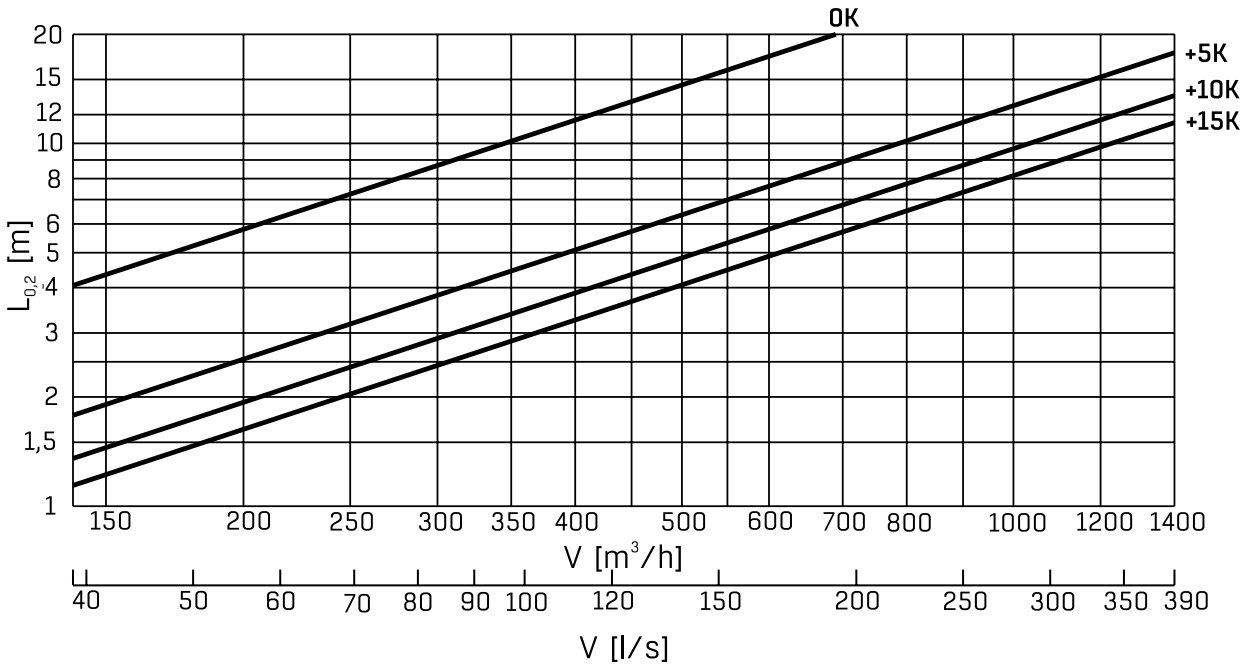
PRODUCT CODE EXAMPLE

Swirl diffuser ODZA-50-4-1
Terminal of size 50 adjustable by Belimo electric actuator, painted in RAL 9010 colour.

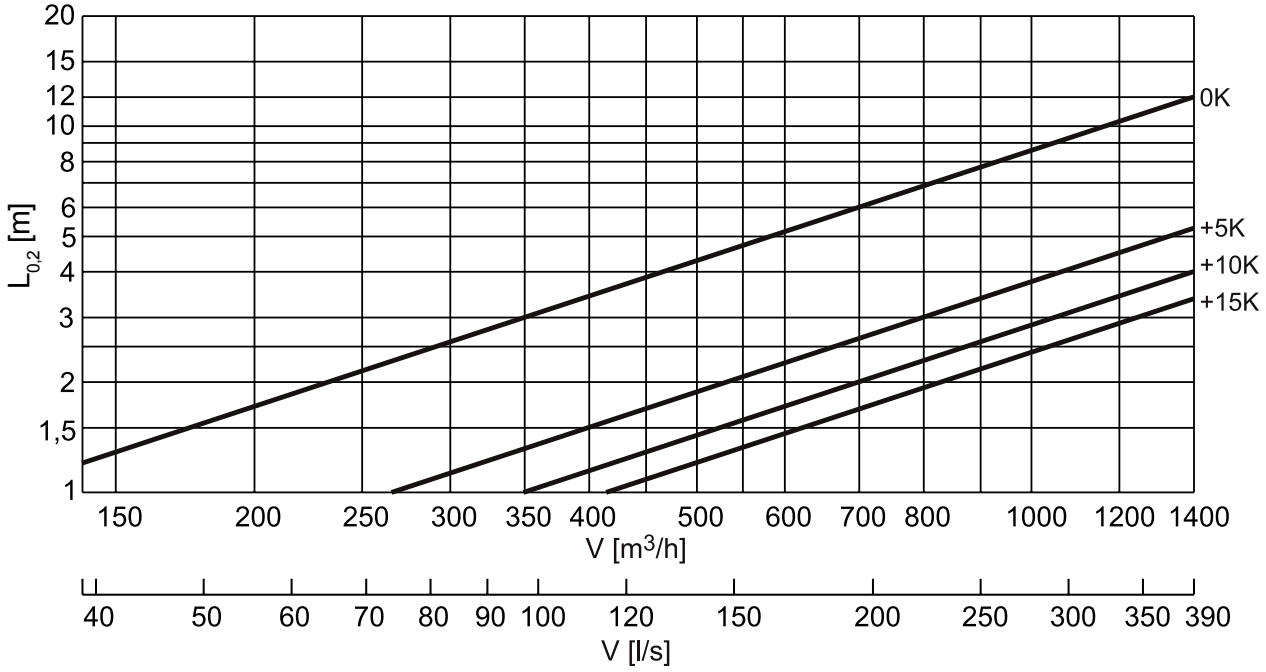
Connection box SKKU-50-50-1-0
Duct connection diameter of 500 mm, diffuser size 50, with sound attenuation material, without damper.

THROW LENGTH

ODZA-25 – THROW LENGTH FOR HEATING FUNCTION (VERTICAL DIFFUSION PATTERN)

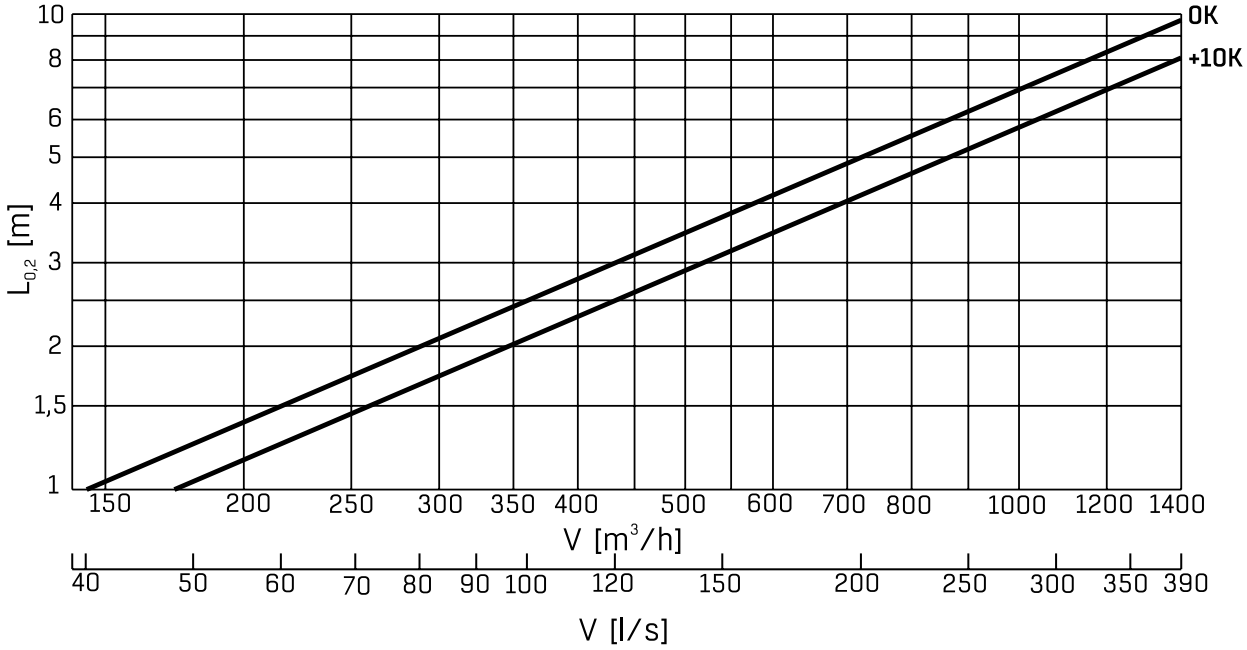


ODZA-25 – THROW LENGTH FOR HEATING FUNCTION (BLADES SET IN MIDDLE POSITION - AIR SUPPLY AT 45^0 ANGLE)



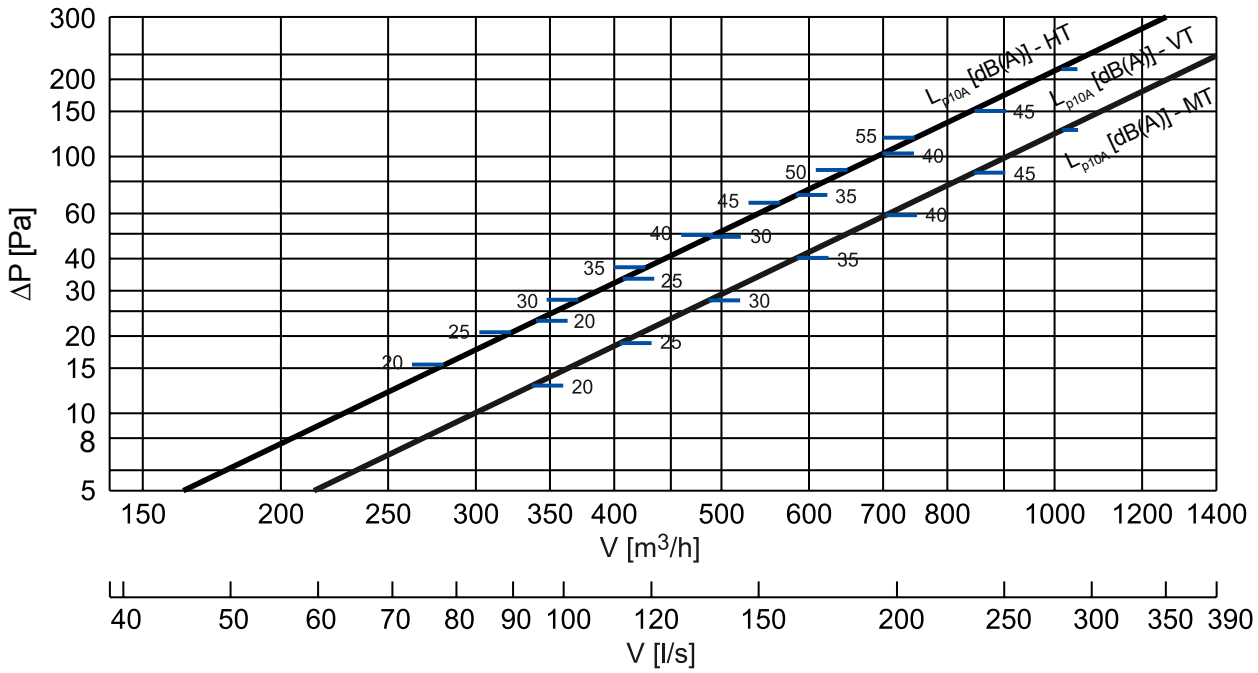
THROW LENGTH, AIR FLOW, PRESSURE DROP, SOUND LEVEL

ODZA-25 – THROW LENGTH FOR COOLING FUNCTION (HORIZONTAL DIFFUSION PATTERN)



Horizontal throw $L_{0,2}$ has been measured for freely hanging case

ODZA-25 – AIR FLOW, PRESSURE DROP, SOUND LEVEL

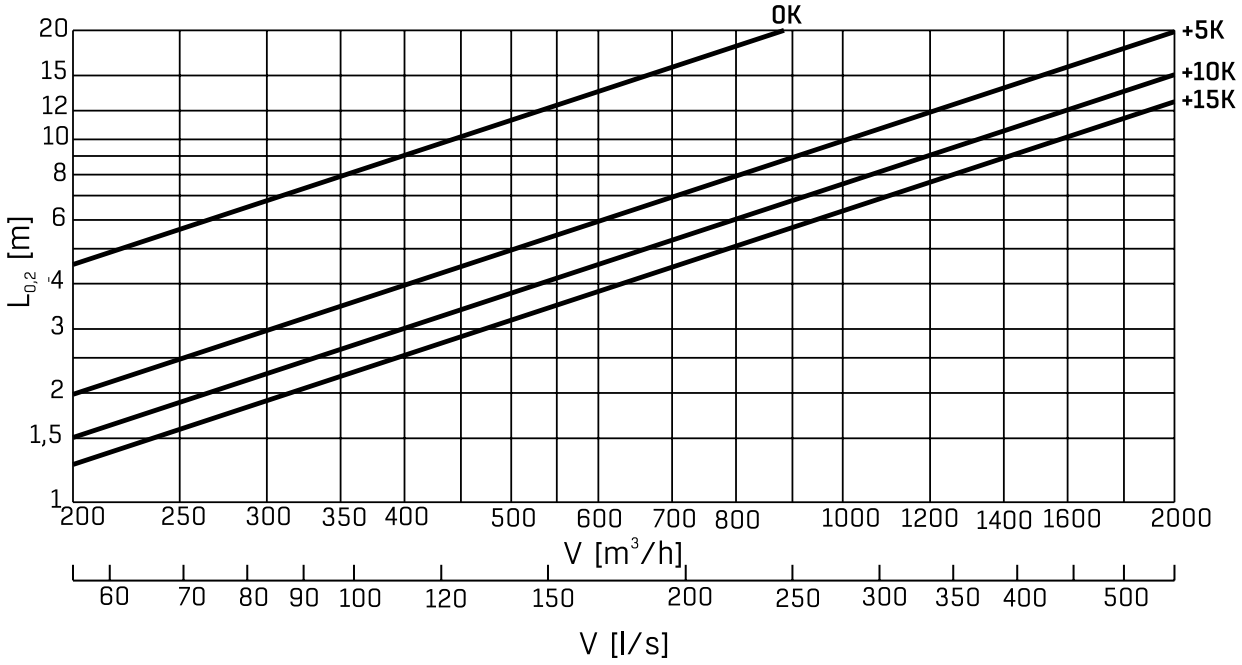


In the above graph the sound pressure levels are indicated in dB(A) for a reference room with 10 m^2 Sabine room absorption, equivalent to 4 dB room attenuation.

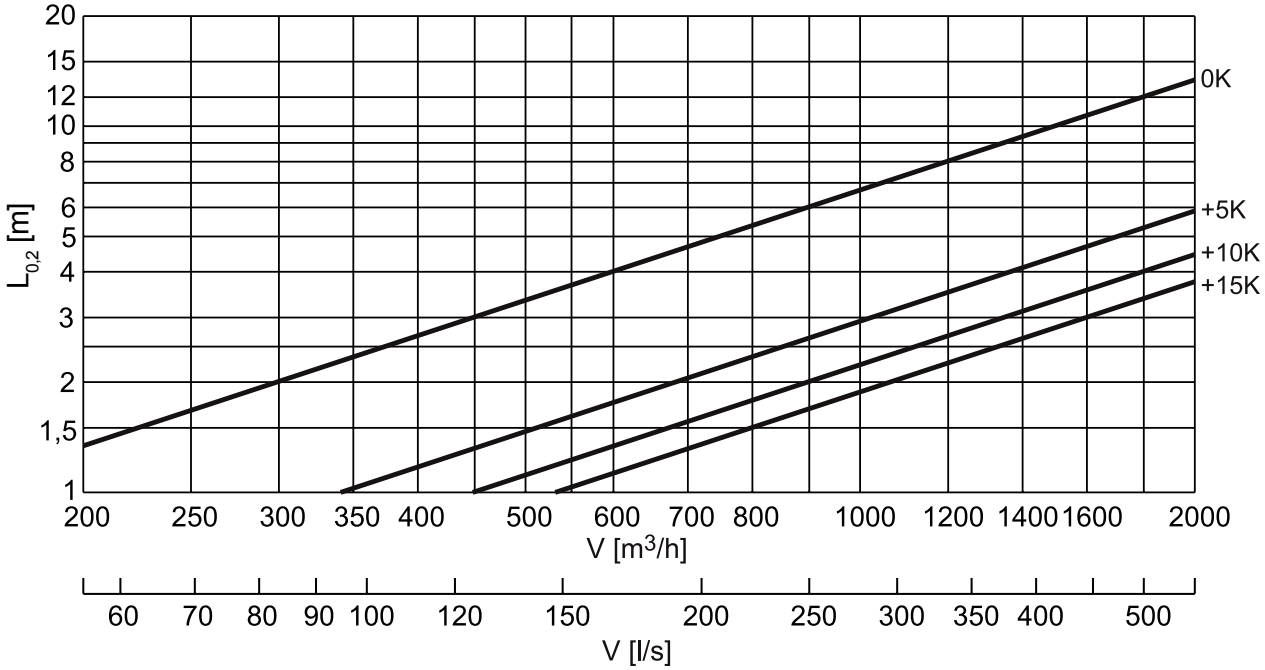
HT = horizontal air supply
VT = vertical air supply
MT = blades set in middle positiion - air supply at 45° angle)

THROW LENGTH

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

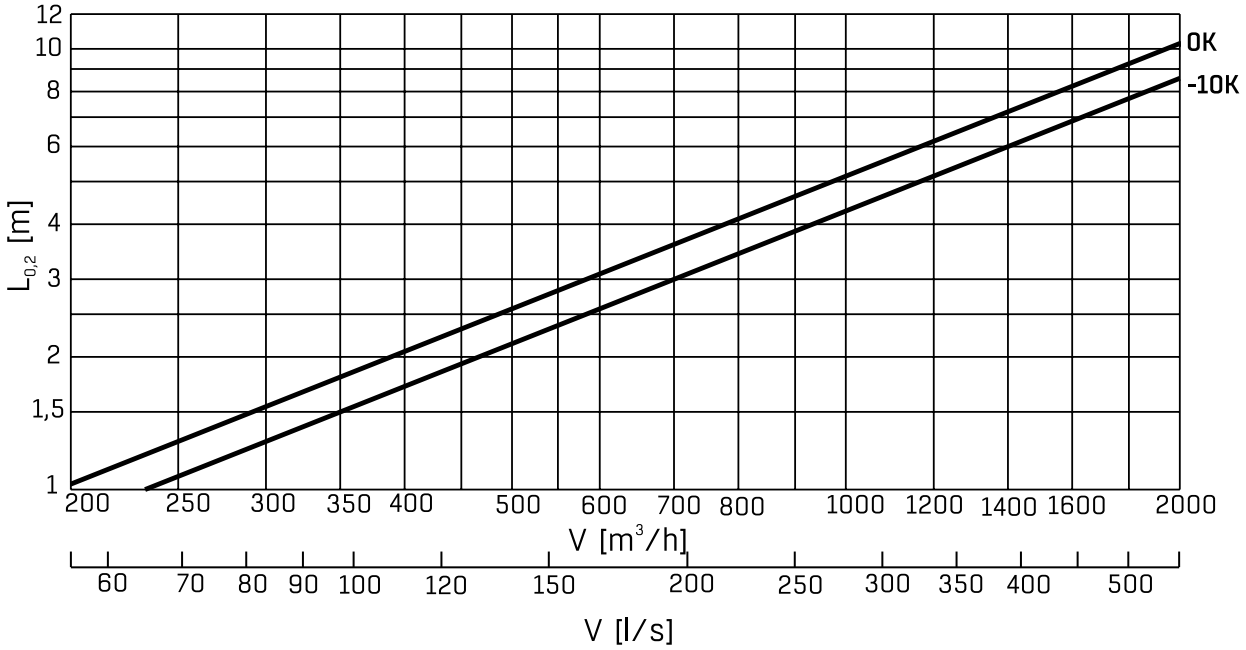


ODZA-31 – THROW LENGTH FOR HEATING FUNCTION (BLADES SET IN MIDDLE POSITION - AIR SUPPLY AT 45⁰ ANGLE)



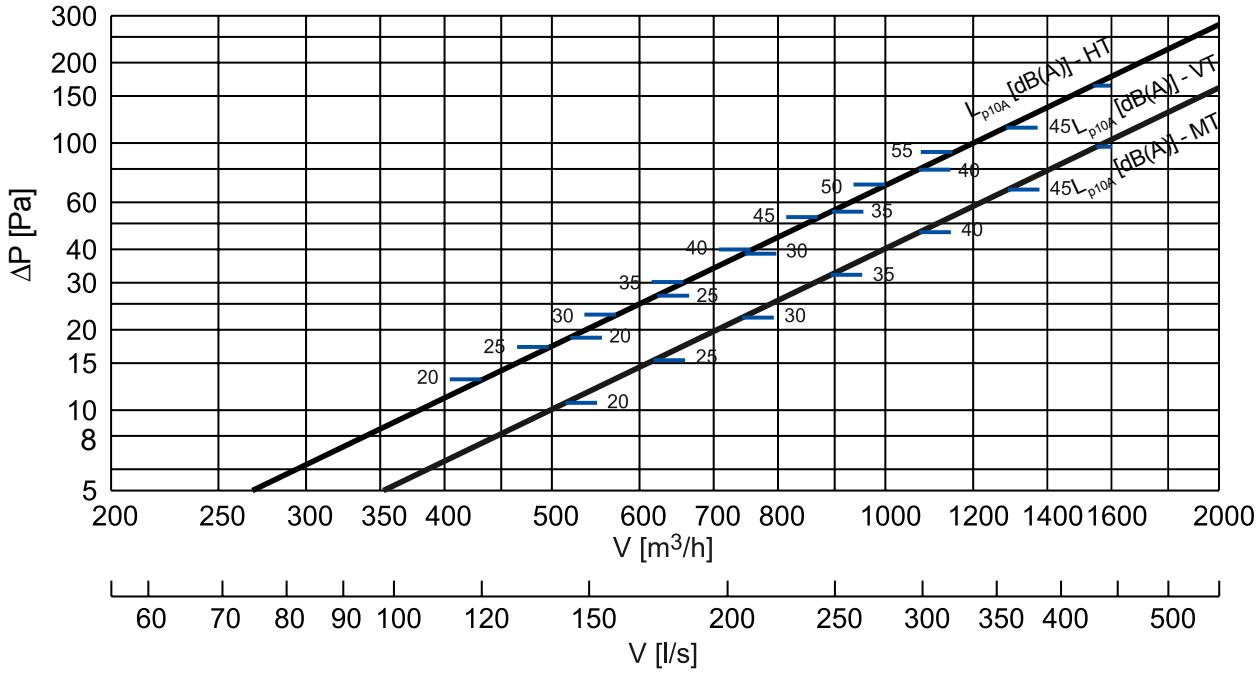
THROW LENGTH, AIR FLOW, PRESSURE DROP, SOUND LEVEL

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



Horizontal throw $L_{0.2}$ has been measured for freely hanging case

ODZA-31 – AIR FLOW, PRESSURE DROP, SOUND LEVEL

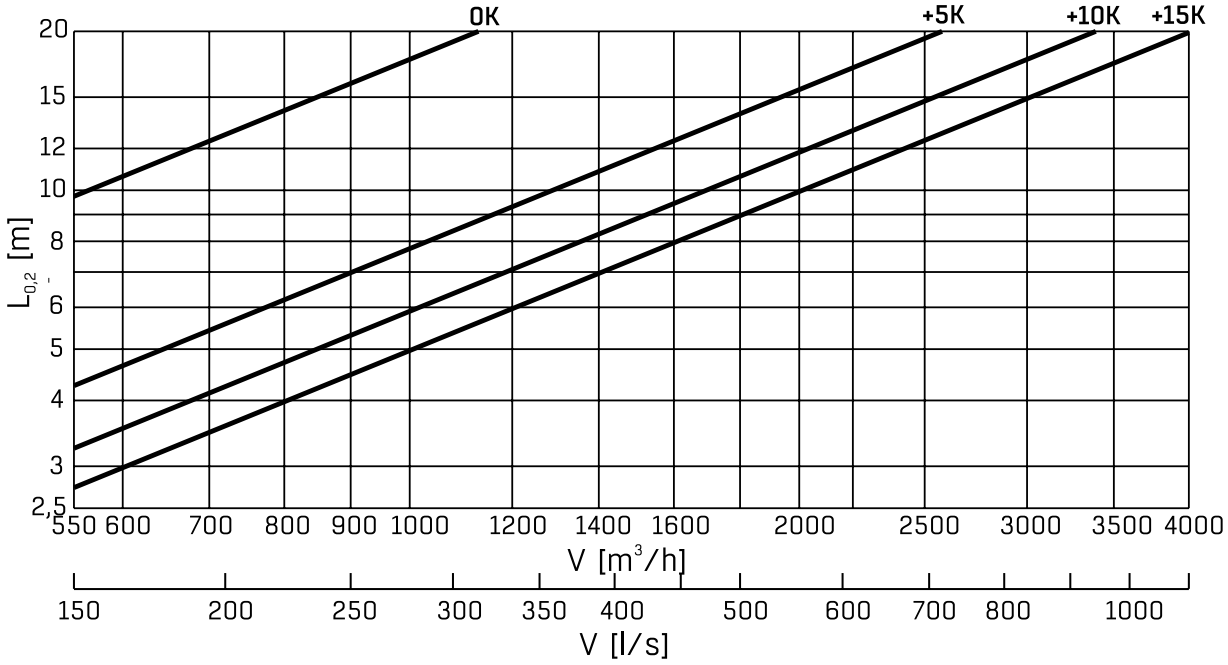


In the above graph the sound pressure levels are indicated in dB(A) for a reference room with 10 m^2 Sabine room absorption, equivalent to 4 dB room attenuation.

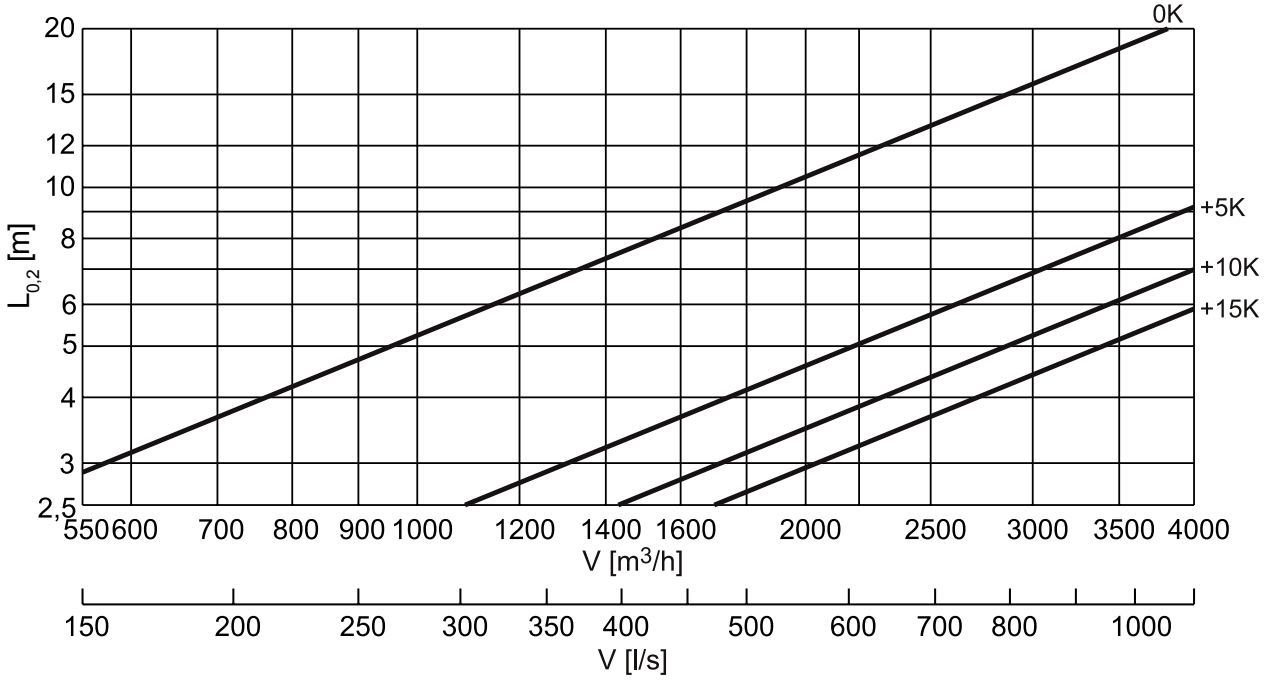
HT = horizontal air supply
VT = vertical air supply
MT = blades set in middle positiion - air supply at 45° angle)

THROW LENGTH

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

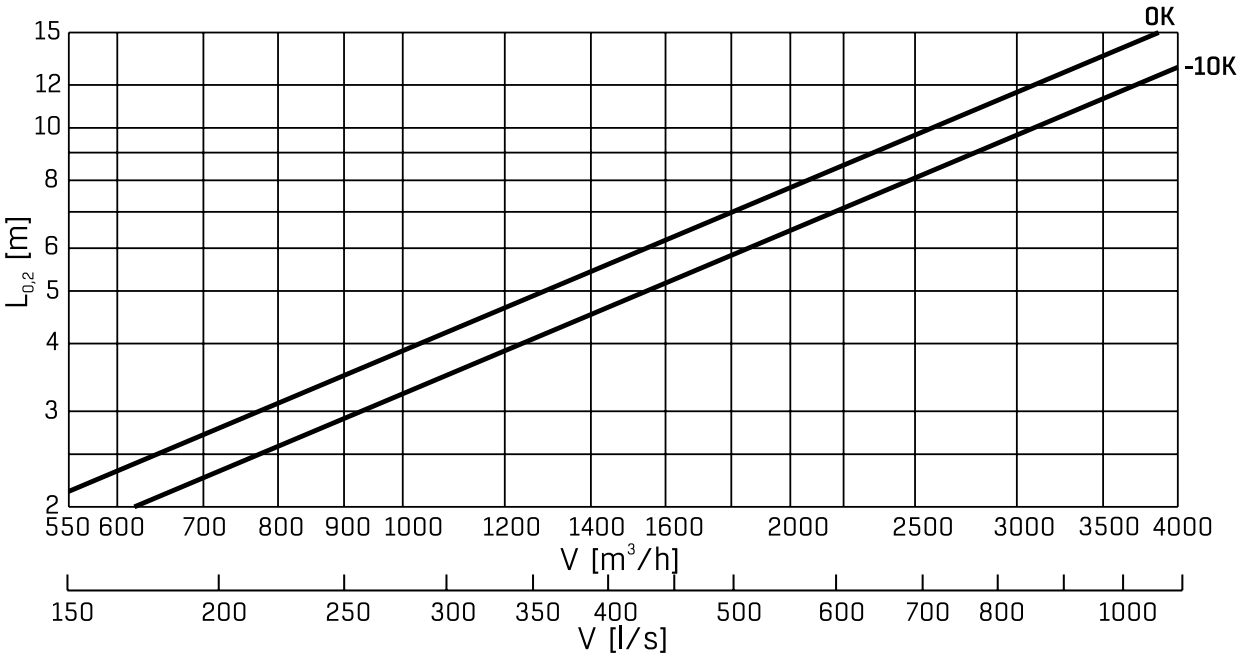


ODZA-40 – THROW LENGTH FOR HEATING FUNCTION (BLADES SET IN MIDDLE POSITION - AIR SUPPLY AT 45^0 ANGLE)



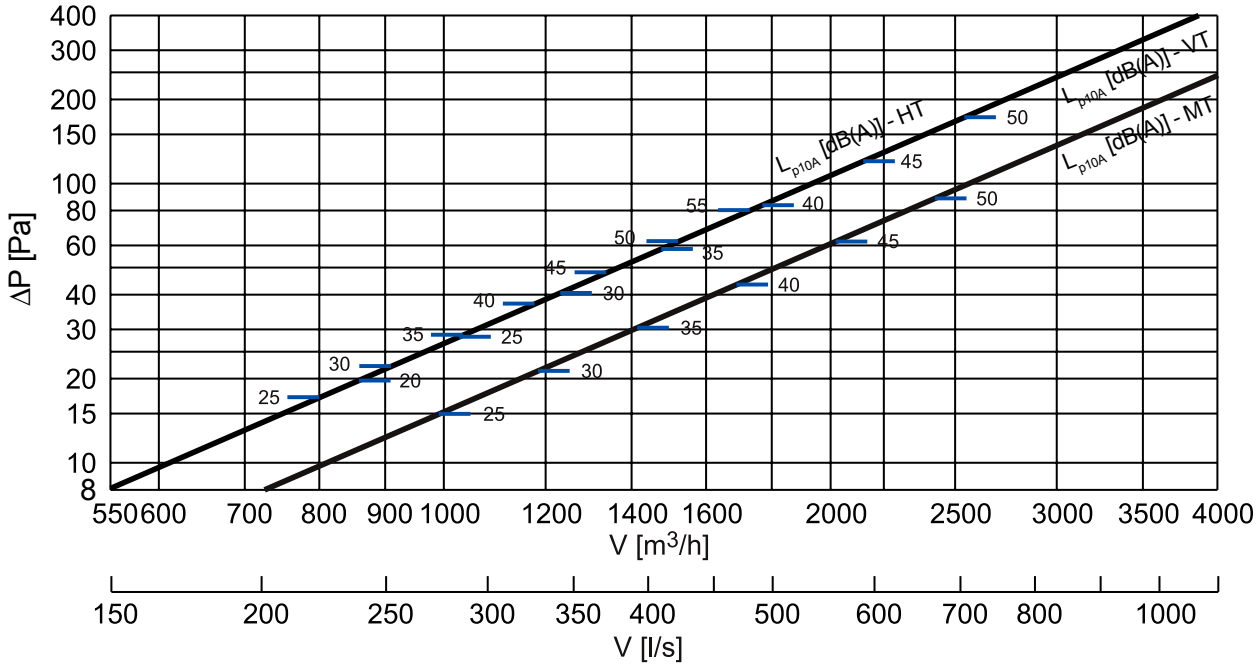
THROW LENGTH, AIR FLOW, PRESSURE DROP, SOUND LEVEL

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



Horizontal throw $L_{0.2}$ has been measured for freely hanging case

ODZA-40 – AIR FLOW, PRESSURE DROP, SOUND LEVEL

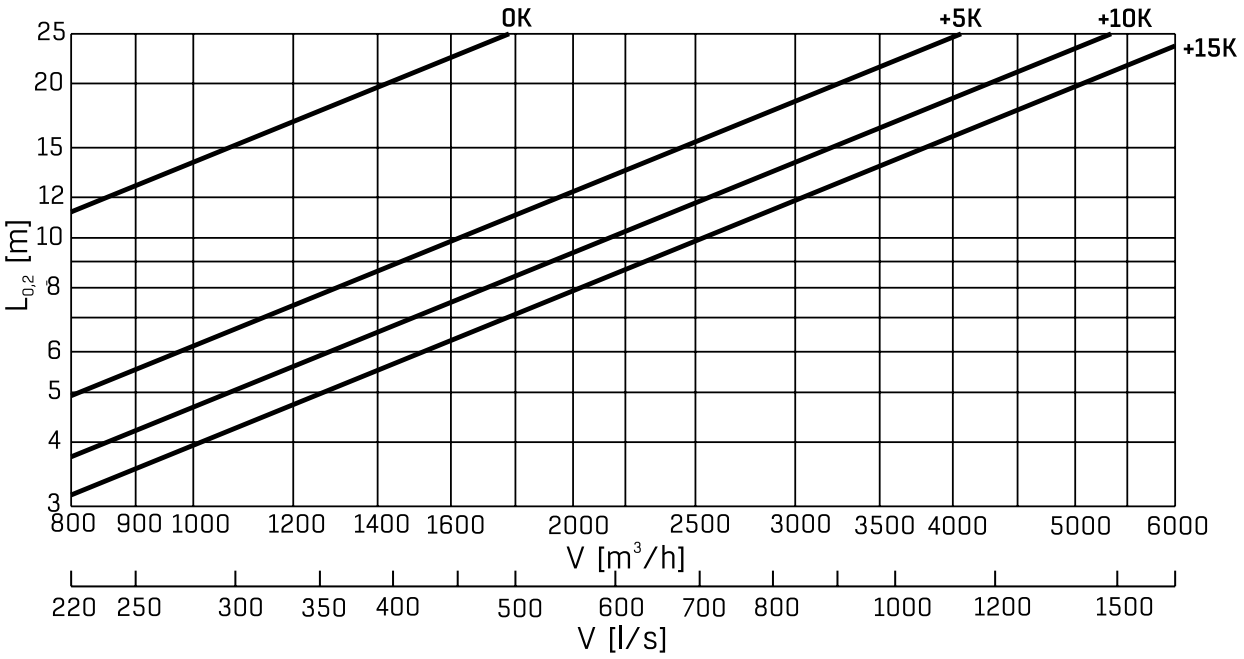


In the above graph the sound pressure levels are indicated in dB(A) for a reference room with 10 m² Sabine room absorption, equivalent to 4 dB room attenuation.

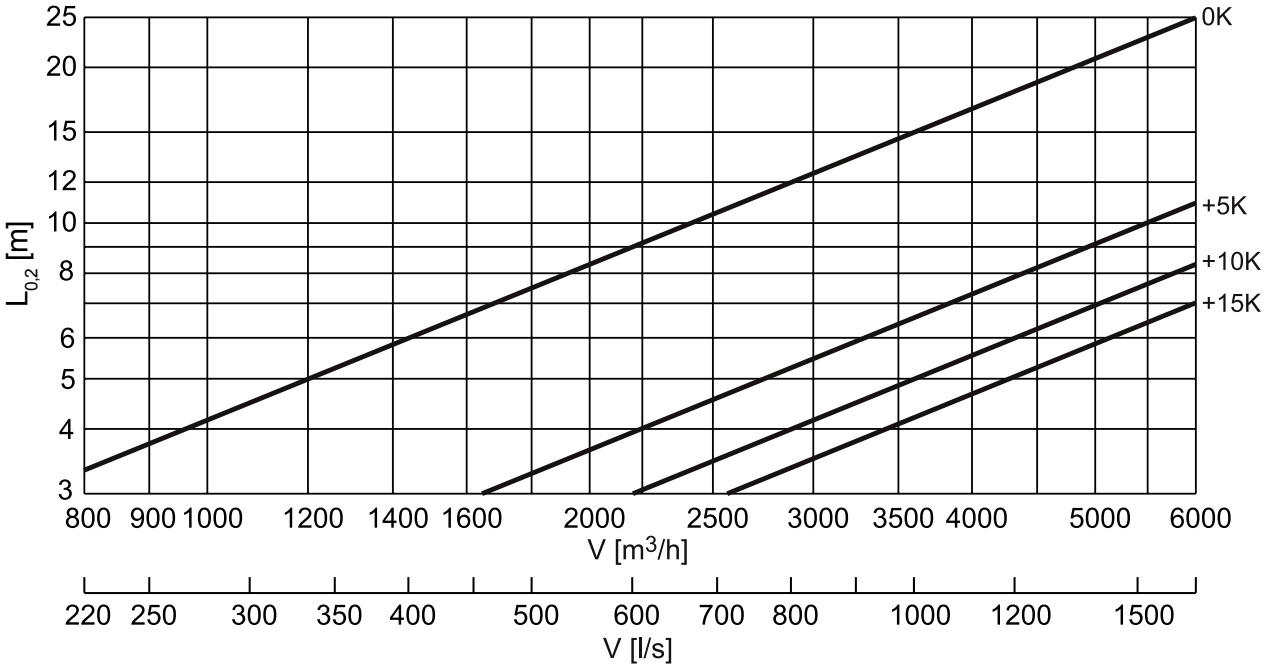
HT = horizontal air supply
VT = vertical air supply
MT = blades set in middle positiion - air supply at 45° angle)

THROW LENGTH

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

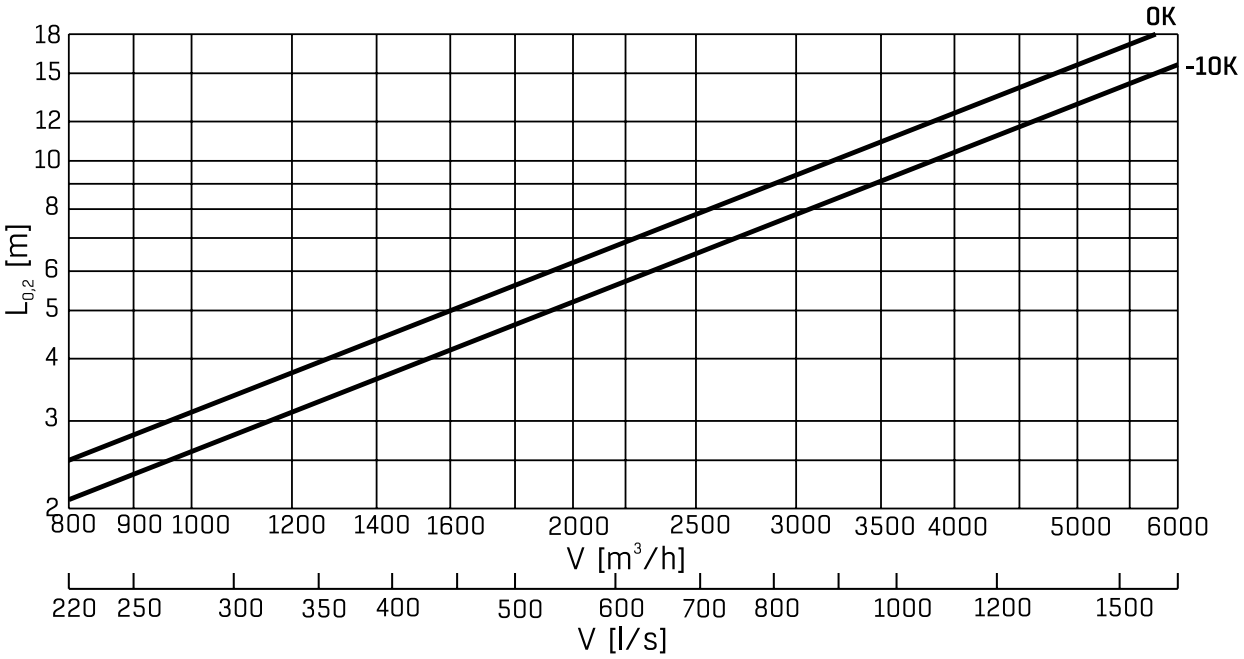


ODZA-50 – THROW LENGTH FOR HEATING FUNCTION (BLADES SET IN MIDDLE POSITION - AIR SUPPLY AT 45⁰ ANGLE)



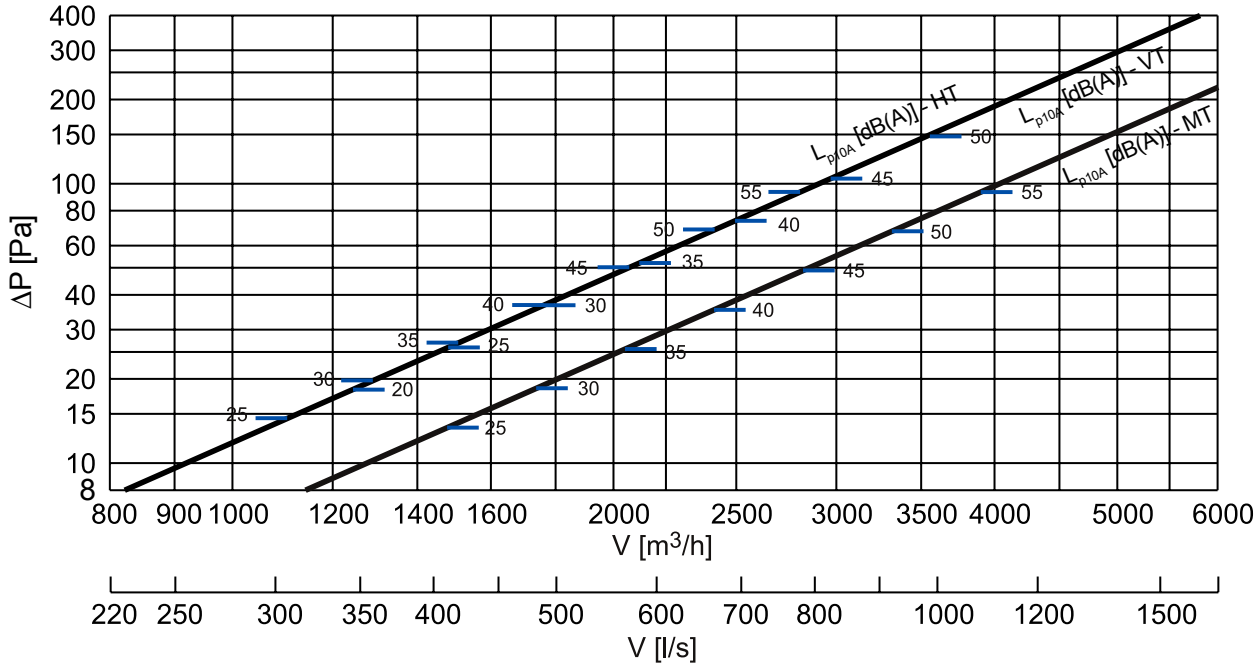
THROW LENGTH, AIR FLOW, PRESSURE DROP, SOUND LEVEL

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



Horizontal throw $L_{0.2}$ has been measured for freely hanging case

ODZA-50 – AIR FLOW, PRESSURE DROP, SOUND LEVEL



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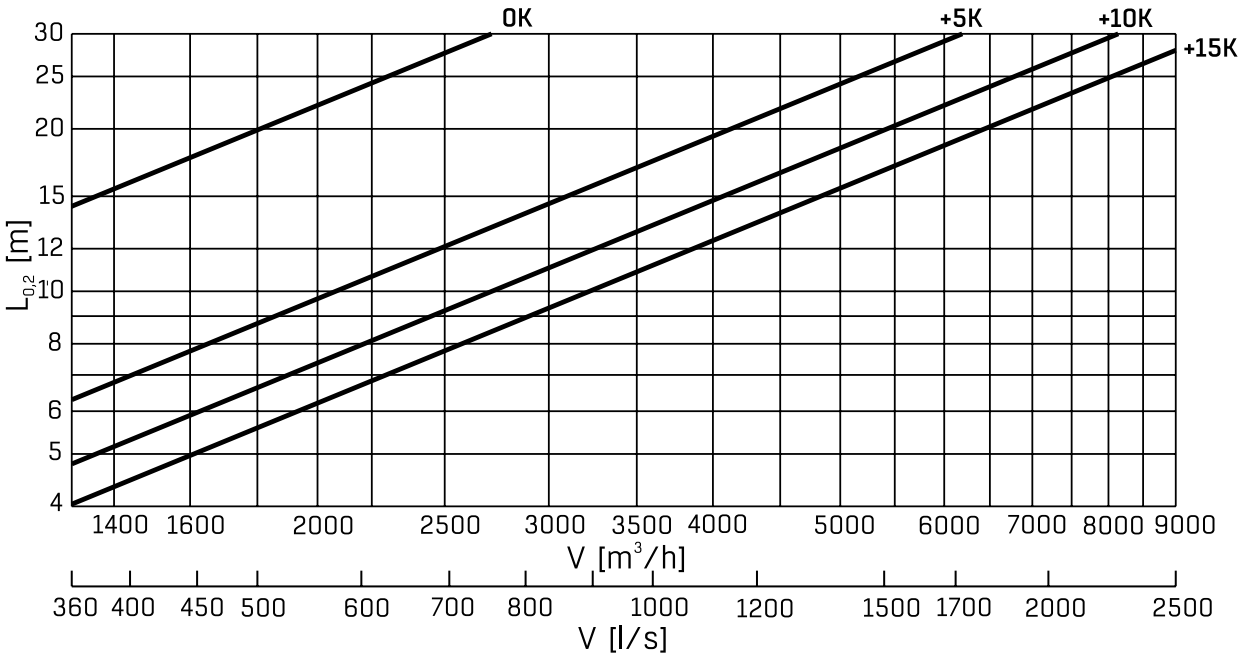
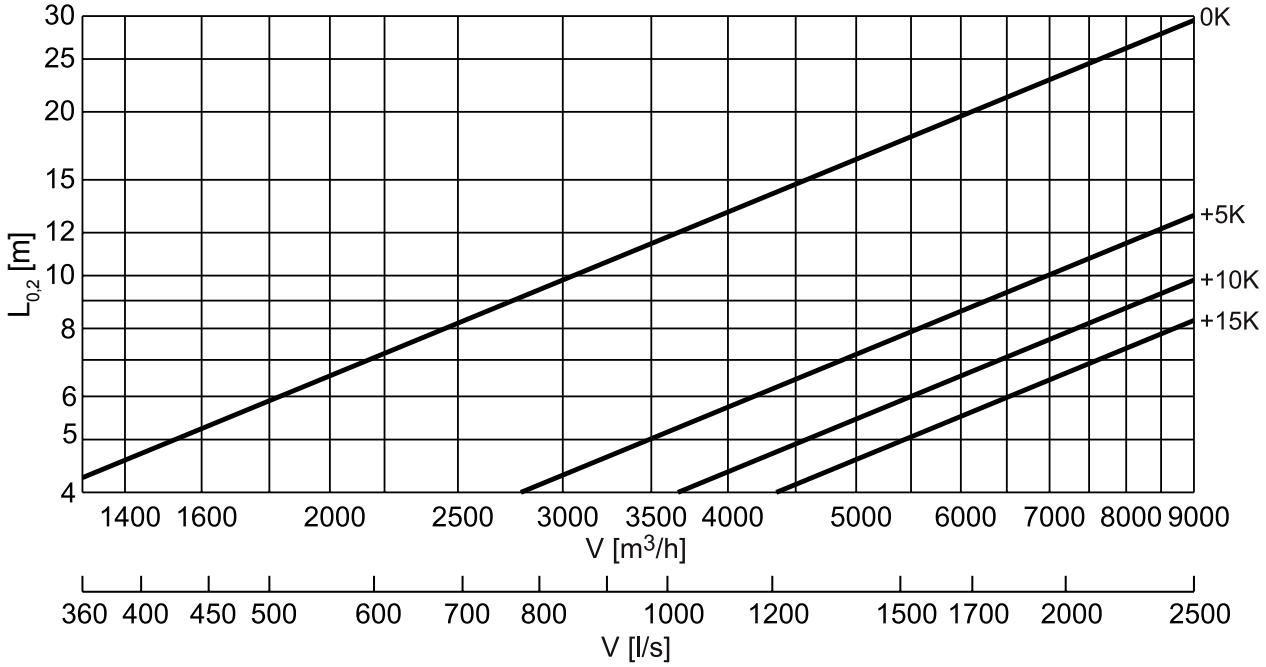
THROW LENGTH

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

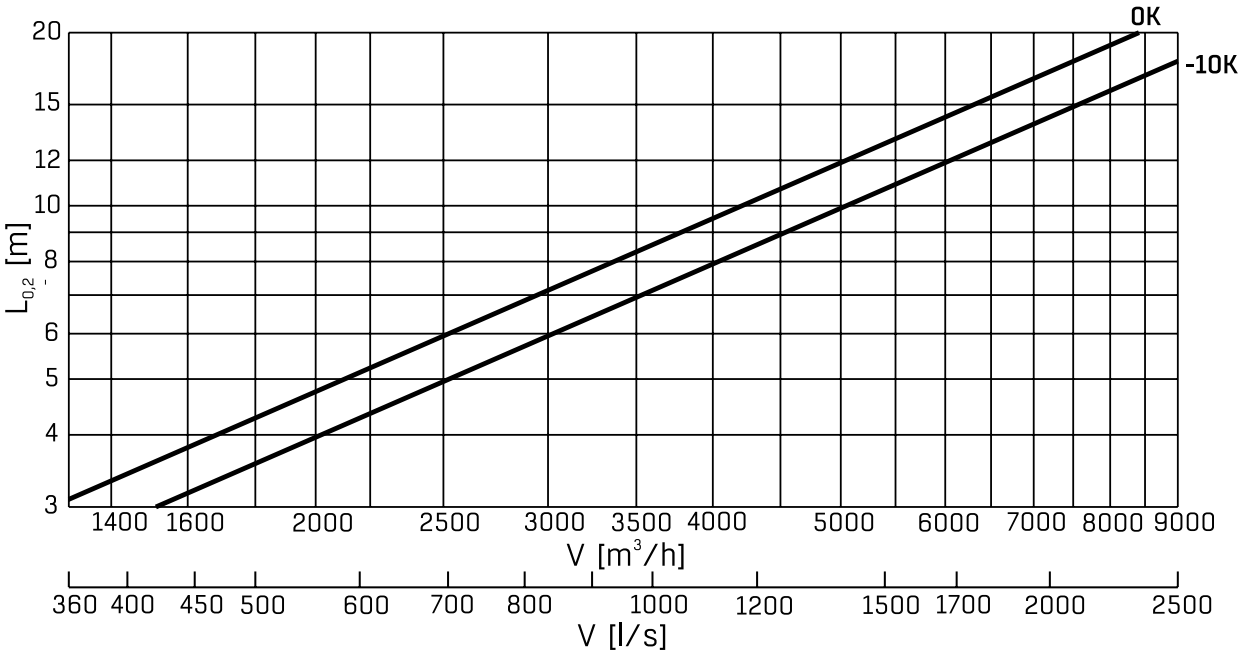


ODZA-63 – THROW LENGTH FOR HEATING FUNCTION (BLADES SET IN MIDDLE POSITION - AIR SUPPLY AT 45⁰ ANGLE)



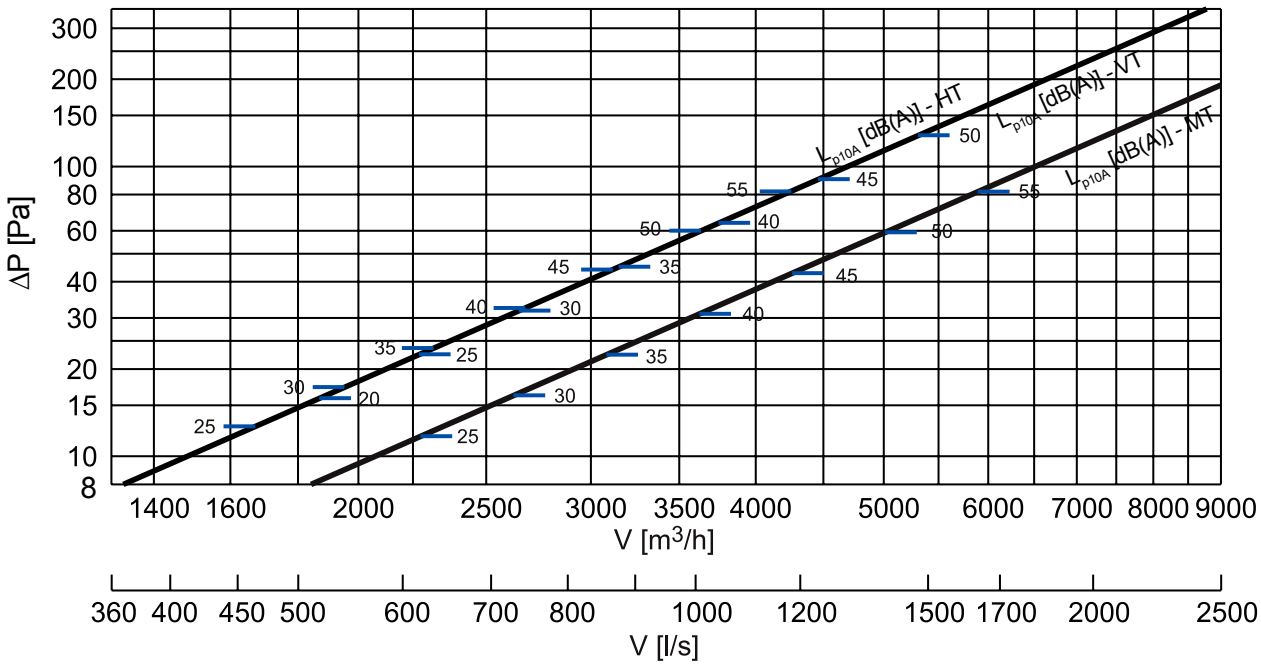
THROW LENGTH, AIR FLOW, PRESSURE DROP, SOUND LEVEL

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



Horizontal throw $L_{0.2}$ has been measured for freely hanging case

ODZA-63 – AIR FLOW, PRESSURE DROP, SOUND LEVEL

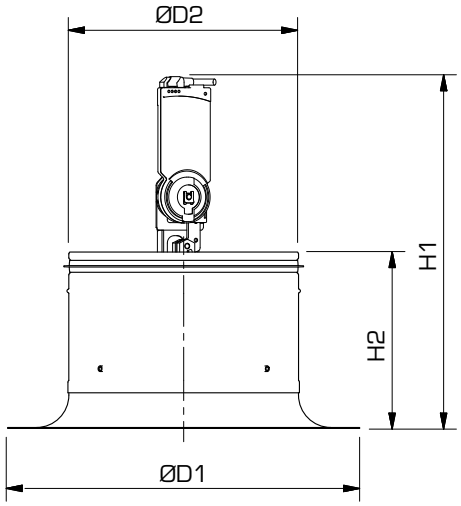


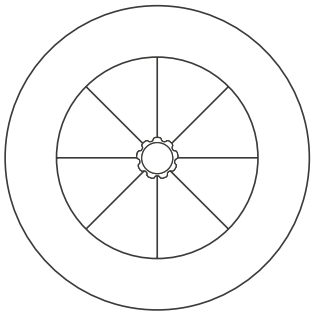
In the above graph the sound pressure levels are indicated in dB(A) for a reference room with 10 m² Sabine room absorption, equivalent to 4 dB room attenuation.

HT = horizontal air supply
VT = vertical air supply
MT = blades set in middle positiion - air supply at 45° angle)

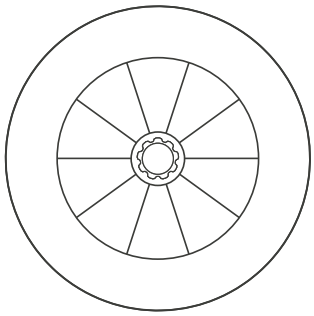
DIMENSIONS AND INSTALLATION ALTERNATIVES

DIMENSIONS AND WEIGHT





ODZA-25, 31, 40 (8 blades)



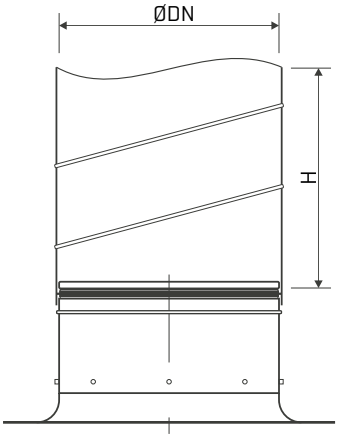
ODZA-50, 63 (10 blades)

Size	ØD1 (mm)	ØD2 (mm)	H1 (mm)	H2 (mm)	Weight (kg)
25	373	248	380	190	2,0/2,6
31	463	313	385	211	3,6/4,2
40	625	397	385	249	4,0/4,7
50	768	497	385	259	5,0/5,7
63	930	627	433	310	9,0/9,9

H1 - electric actuator version
H2 - manual version

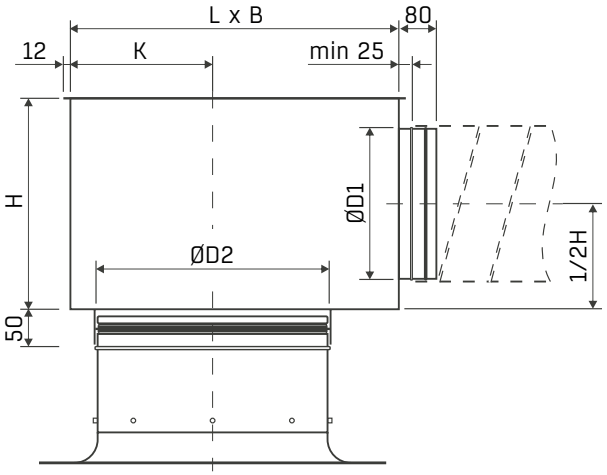
INSTALLATION ALTERNATIVES

Directly to circular duct



Note! Length of the straight duct before diffuser shouldn't be shorter than 0,8xØDN.

SKKU connection box



Connection box SKKU, model 1:1

Size	ØD1 (mm)	ØD2 (mm)	H (mm)	L (mm)	B (mm)	K (mm)
25-25	249	250	295	700	570	260
31-31	314	315	360	700	570	310
40-40	399	400	455	700	570	300
50-50	499	500	555	700	570	350
63-63	629	630	685	800	800	400

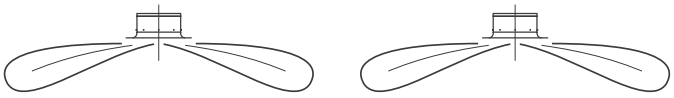
Connection box SKKU, model 1:2

Size	ØD1 (mm)	ØD2 (mm)	H (mm)	L (mm)	B (mm)	K (mm)
20-25	199	250	245	650	480	218
25-31	249	315	295	700	570	260
31-40	314	400	360	700	570	310
40-50	399	500	455	700	570	350
50-63	499	630	555	800	800	400

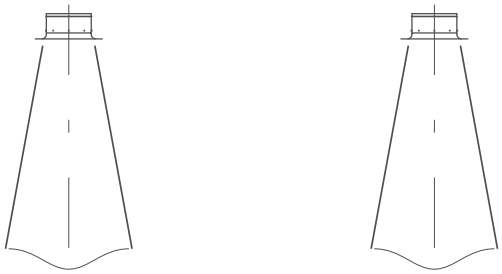
DIFFUSION PATTERN AND ADJUSTMENT

DIFFUSION PATTERNS

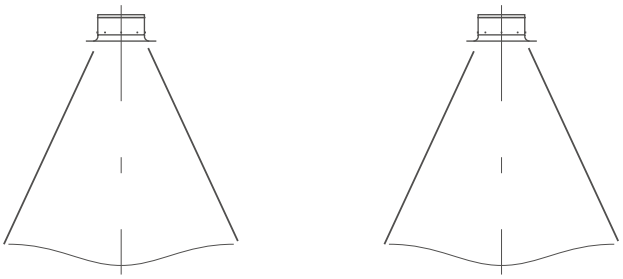
Cooling function, horizontal flow Δt_N = -12K



Heating function, vertical flow Δt_N = +15K

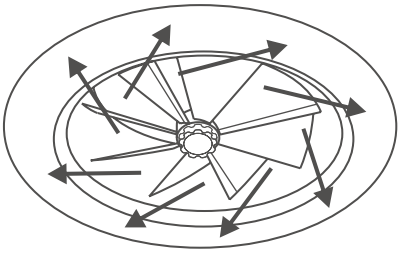


Combined function, diagonal flow

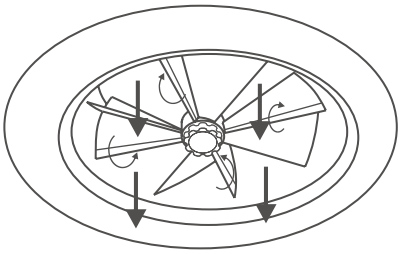


ADJUSTMENT

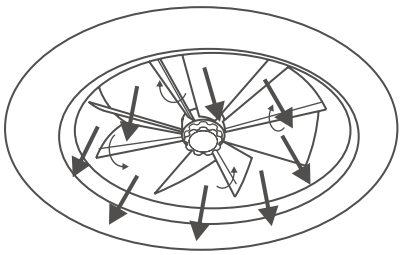
The change of diffusion pattern is made via turning rotating blades.



horizontal diffusion pattern



vertical diffusion pattern

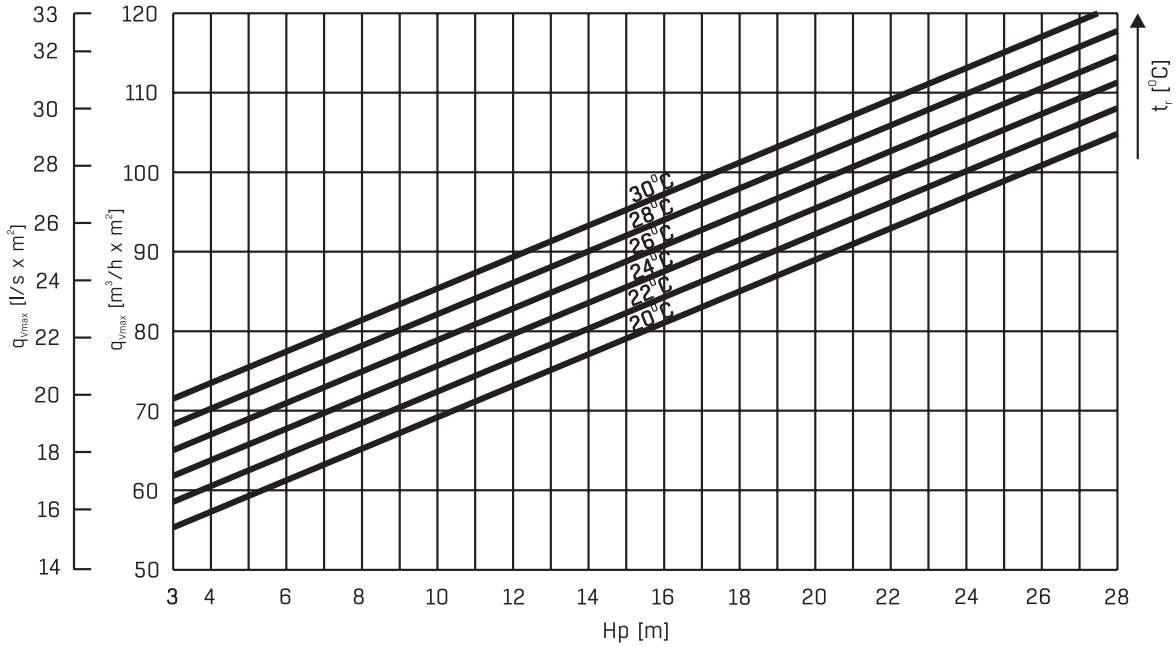


combined diffusion pattern

Depending on version, the change of diffusion pattern can be done:
· manually, via the handle placed in the middle of diffuser,
· automatically, via electric actuator,
· automatically, via thermal element which reacts to the supply air temperature.

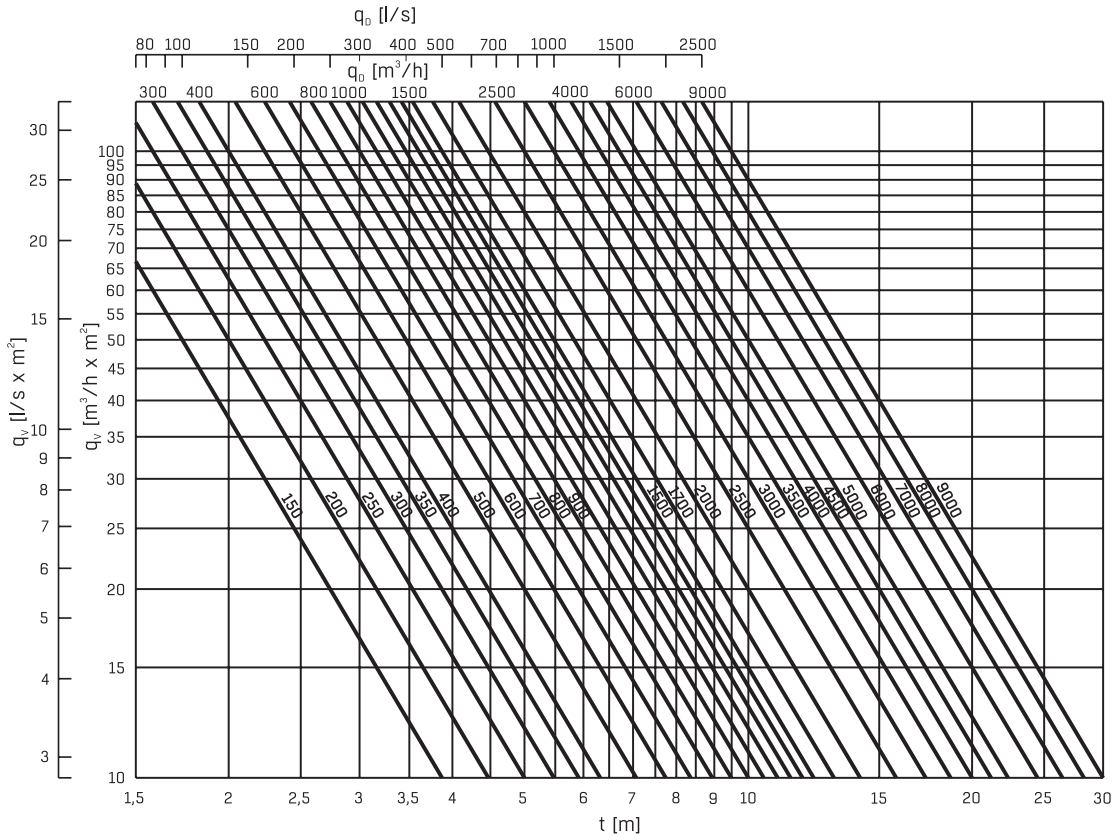
AIR FLOW VOLUME AND DISTANCE BETWEEN DIFFUSERS

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



SOUND DATA, 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

Assumptions

Total air flow q_{tot} = 30 000 m^3/h
Served floor area A = 2000 m^2
Room temperature t_r = 24°C
Required throw length $L_{0.2}$ = 10 m

1. Selection of diffuser, size ODZA-50

Assumed number of diffusers, n	12 pcs.
Diffuser air flow, q_D	2 500 m^3/h
Assumed Δt_v for heating	+10 K
Min air flow taken from the graph for the diffuser heating function	2 140 m^3/h
Assumed distance between diffusers, t	12.5 m
Volume air flow, q_v (from graph)	16.0 $m^3/h \times m^2$
Max volume air flow, for H_p = 11.8 m and t_r = 24°C	79 $m^3/h \times m^2$
Min distance between diffusers, t_{min} where q_{Vmax} = 79 $m^3/h \times m^2$ is not exceeded	5.6 m

2. Selection of diffuser, size ODZA-31

Assumed number of diffusers, n	22 pcs.
Diffuser air flow, q_D	1 363 m^3/h
Assumed Δt_v for heating	+10 K
Min air flow taken from the graph for the diffuser heating function	1 330 m^3/h
Assumed distance between diffusers, t	9.0 m
Volume air flow, q_v (from graph)	16.8 $m^3/h \times m^2$
Max volume air flow, for H_p = 11,8 m and t_r = 24°C	79 $m^3/h \times m^2$
Min distance between diffusers, t_{min} where q_{Vmax} = 71 $m^3/h \times m^2$ is not exceeded	4.2 m

You can obtain 3D visualizations of diffusion patterns from our on-line selection software called SELECT.

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
25	15	6	1	3	0	-9	-14	-15
31	15	6	1	3	0	-9	-14	-15
40	9	4	1	2	1	-9	-16	-20
50	13	8	2	3	-1	-9	-14	-15
63	13	8	2	3	-1	-9	-14	-15

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_{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 ODZA.

DEFINITIONS

V	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

GENERAL

CONSTRUCTION AND FUNCTION

ODZA is a swirl ceiling mounted supply air terminal that is recommended to be mounted with SKKU plenum box or directly to the duct. Its diffusion pattern can be changed from horizontal to vertical in order to adapt to summer or winter conditions. Position of the blades can be controlled manually or automatically. In latter case, it is available with regulation via thermal element or electric actuator.
Patented method of controlling supply air direction, ensures very good performance in terms of vertical throw length.
Smaller sizes of SKKU plenum box (duct connection size up to 315mm) features an extremely quiet patented measurement and adjustment ZAEF damper for multipoint measuring with balanced and accurate values. The adjustment handle of the measurement and adjustment damper has a position indicator and a locking device. The measurement and adjustment damper can be easily removed (only 1:2 model) for inspection and cleaning without changing the setting. SKKU connection box is available with or without sound attenuation material. In each plenum box, there are lugs attached to the walls for hanging purposes.
ODZA 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. ODZA is powder-coated for a high surface finish. The standard colour is RAL 9010, 30% 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 ODZA is a ceiling supply swirl diffuser that consists of external casing and internal movable blades, which position can be set due to actual demand in terms of diffusion pattern shape. Unit can be controlled manually or automatically via thermal elements or electric actuator.
The SKKU plenum box includes effective sound attenuation elements.

PRODUCT CODE AND ACCESSORIES

PRODUCT CODE

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

Size (aa)
25, 31, 40, 50, 63
Flow pattern regulation (b)
1 = manual
2 = by thermal element
4 = by electric actuator
Colour (c)
1 = standard RAL 9010
X = any other colour from RAL palette

Connection box 1:1 **SKKU-aa-bb-c-d**

Size (aa-bb)
25-25, 31-31, 40-40, 50-50, 63-63
(duct connection size - diffuser size)
Sound attenuation material (c)
0 = without
1 = with
Damper (d)
0 = without
2 = measurement and adjustment damper ZAEF
(only for duct connection sizes 25 and 31)

Connection box 1:2 **SKKU-aa-bb-c-d**

Size (aa-bb)
20-25, 25-31, 31-40, 40-50, 50-63
(duct connection size - diffuser size)
Sound attenuation material (c)
0 = without
1 = with
Damper (d)
0 = without
2 = measurement and adjustment damper ZAEF
(only for duct connection sizes 20, 25 and 31)

ACCESSORIES

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

Size (bbb)
025-063
Model (c)
1 = standard

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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.

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

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