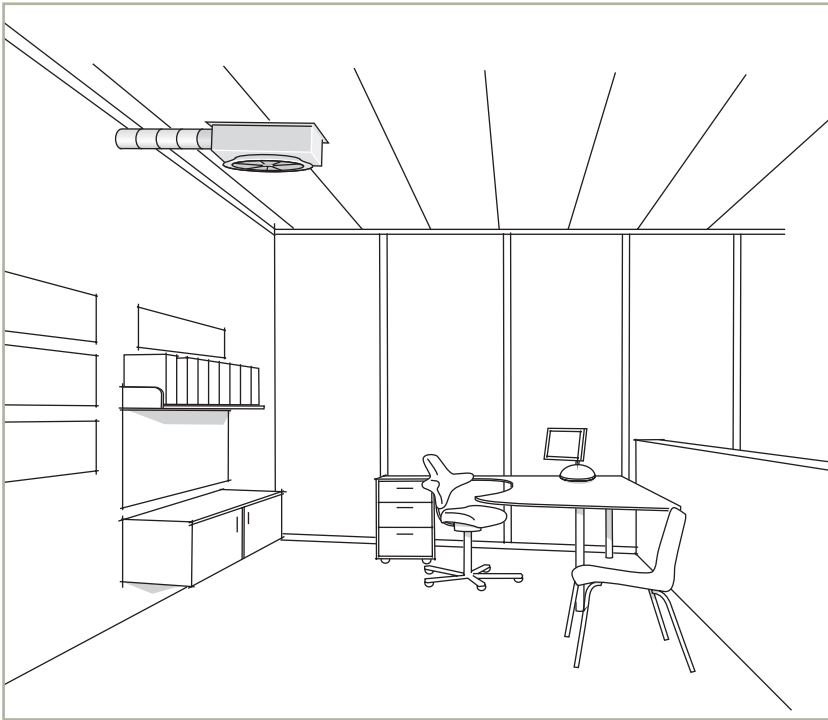


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**Swirl diffuser**  
**NWCA**  
TECHNICAL DATA





Supply swirl diffuser NWCA is recommended to be used in commercial application buildings such as offices, conference rooms, shops, etc. Terminal can be either mounted in false ceiling or installed as a freely hanging.

Full spread of air flow at relatively short distance from device allows using this type of diffuser in premises from 2,2 to 4,5 m high.

NWCA is available in round shape with two installation alternatives: PKAA reducer or SKKA connection box.

PKAA is supplied with perforated plate inside in order to equalize airflow. SKKA can be delivered in two versions: without damper or with measurement and adjustment ZAEF damper.

### QUICK SELECTION

Size	Air flow		Installation height above the floor, m	Sound pressure level $L_{p100A}$ dB(A)
	l/s	m <sup>3</sup> /h		
NWCA-10	11-32	40-115	2,2-3,5	20-48
NWCA-12	11-36	40-120	2,2-3,4	20-48
NWCA-16	11-61	60-220	2,4-4,0	20-40
NWCA-18	21-83	75-300	2,4-4,0	20-41
NWCA-25	39-133	140-480	2,7-4,0	22-43
NWCA-31	56-194	200-700	2,7-4,0	20-42
NWCA-35	111-267	400-960	2,9-4,5	20-39

### SPECIFICATIONS

- Available in 7 sizes, connections from 100 to 355 mm
- Two connection alternatives, with connection box SKKA or with duct socket PKAA
- For supply and exhaust air

### PRODUCT CODE EXAMPLE

#### Swirl diffuser NWCA-31-1-1

Terminal of size 31, painted in RAL 9010 colour.

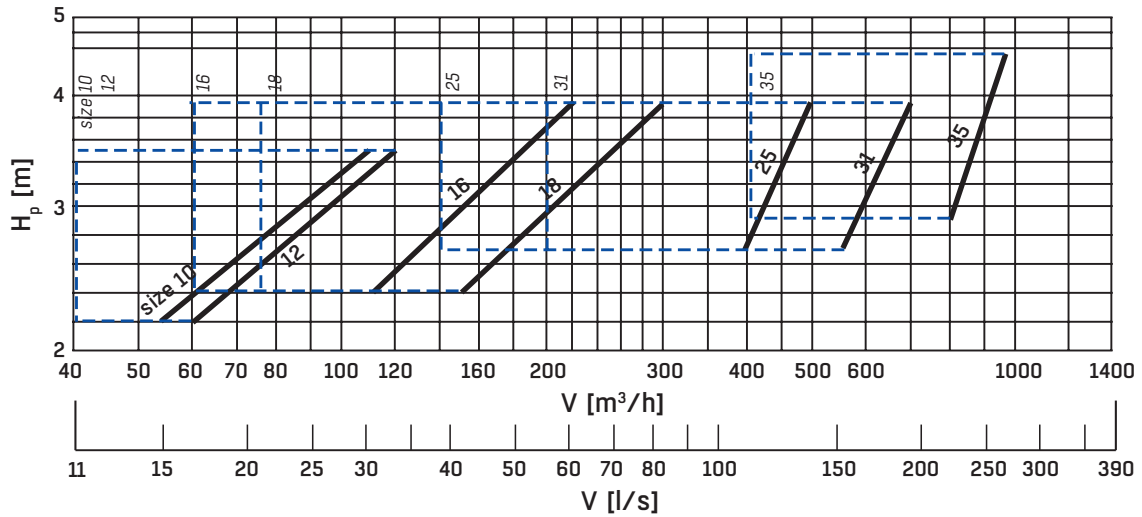
#### Connection box SKKA-25-31-1-2

Duct connection diameter of 250 mm, diffuser size 31, with sound attenuation material, with ZAEF measurement and adjustment damper.

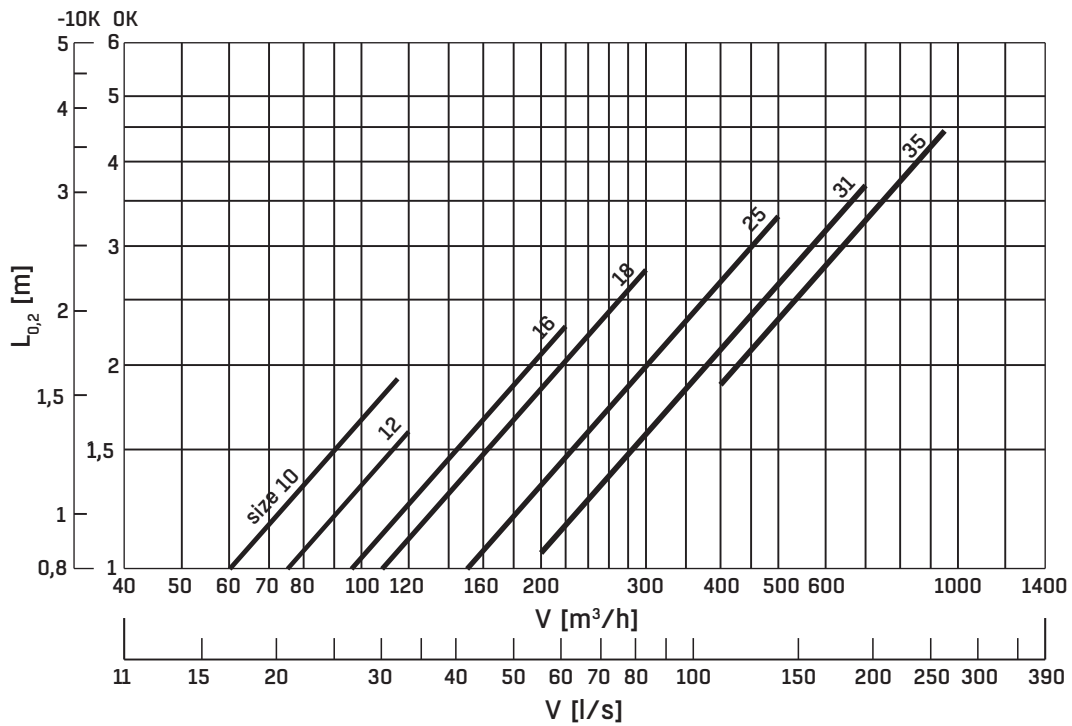
## INSTALLATION HEIGHT, THROW LENGTH

### INSTALLATION HEIGHT - SELECTION DIAGRAM

$H_p$  = diffuser installation height above the floor



### THROW LENGTH

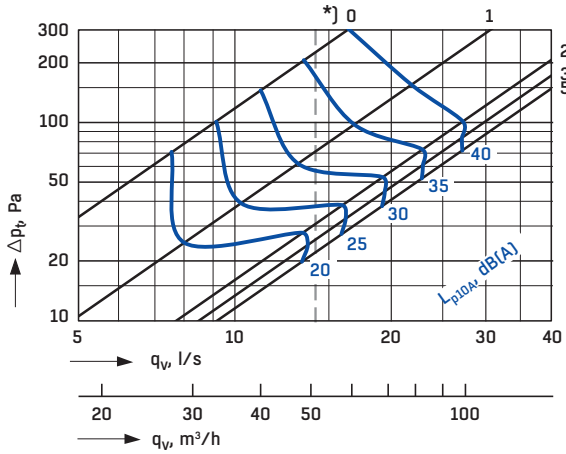


Horizontal throw  $L_{0,2}$  has been measured for diffuser installed flush to the ceiling.

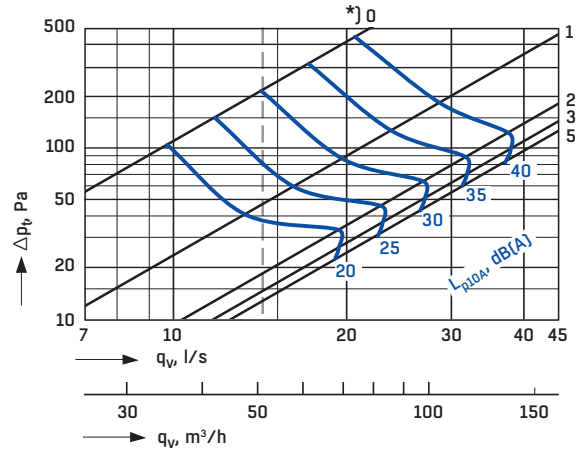
## AIR FLOW, PRESSURE DROP, SOUND LEVEL

### DIFFUSER WITH ACOUSTICALLY UNINSULATED CONNECTION BOX - SUPPLY AIR

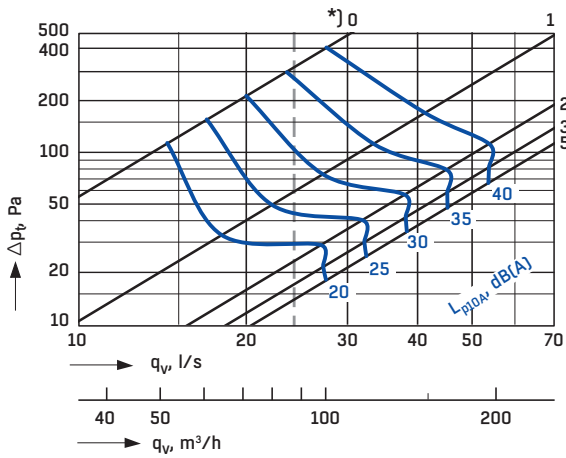
NWCA-10+SKKA-10-10-0-2



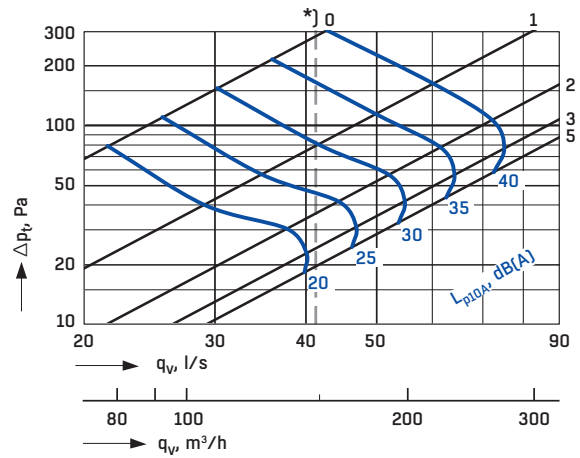
NWCA-12+SKKA-10-12-0-2



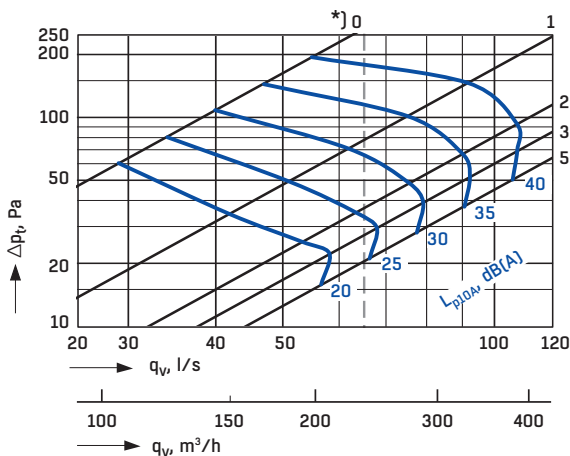
NWCA-16+SKKA-12-16-0-2



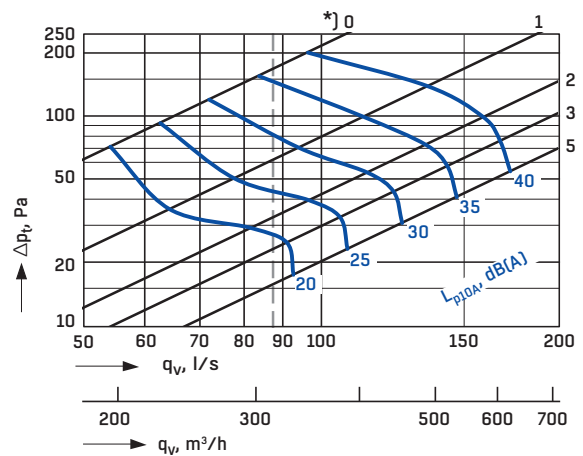
NWCA-18+SKKA-16-18-0-2



NWCA-25+SKKA-20-25-0-2



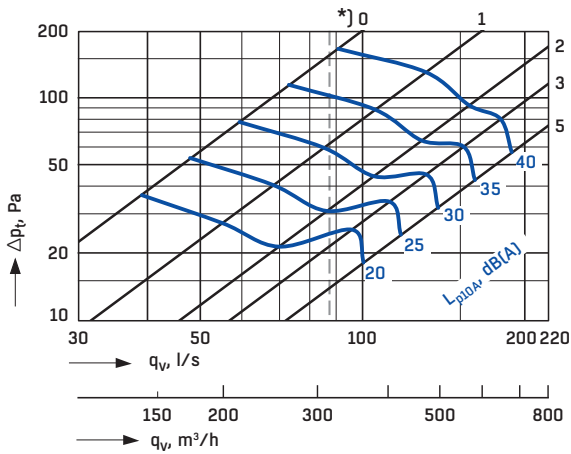
NWCA-31+SKKA-25-31-0-2



## AIR FLOW, PRESSURE DROP, SOUND LEVEL

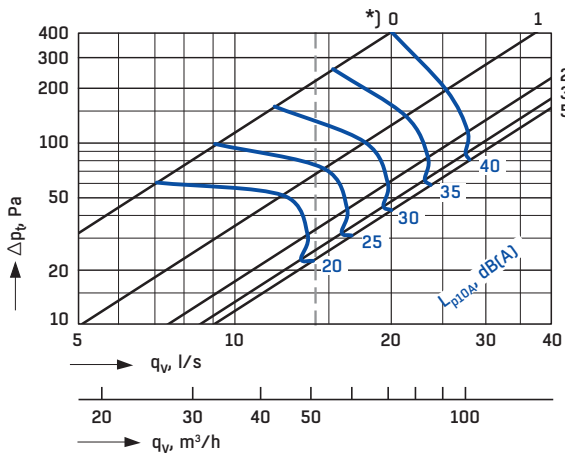
### DIFFUSER WITH ACOUSTICALLY UNINSULATED CONNECTION BOX - SUPPLY AIR

#### NWCA-35+SKKA-25-35-0-2

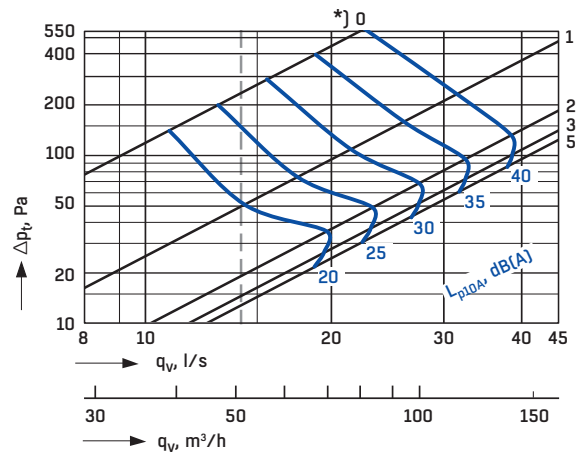


### DIFFUSER WITH ACOUSTICALLY INSULATED CONNECTION BOX - SUPPLY AIR

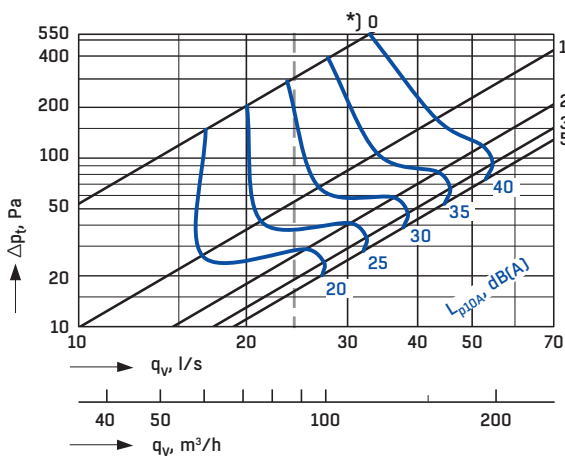
#### NWCA-10+SKKA-10-10-1-2



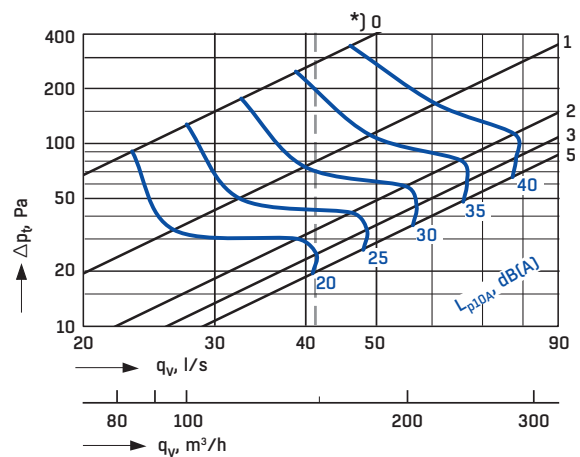
#### NWCA-12+SKKA-10-12-1-2



#### NWCA-16+SKKA-12-16-1-2



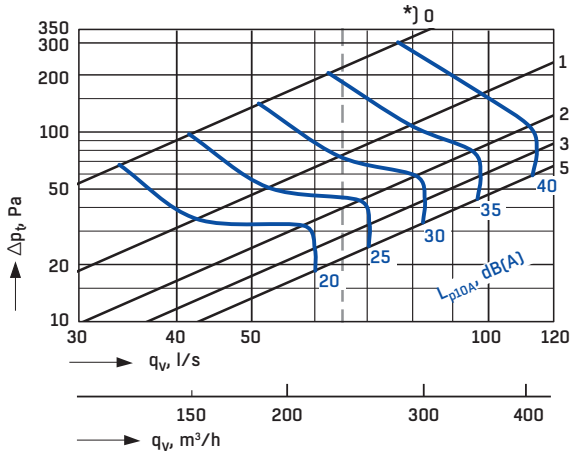
#### NWCA-18+SKKA-16-18-1-2



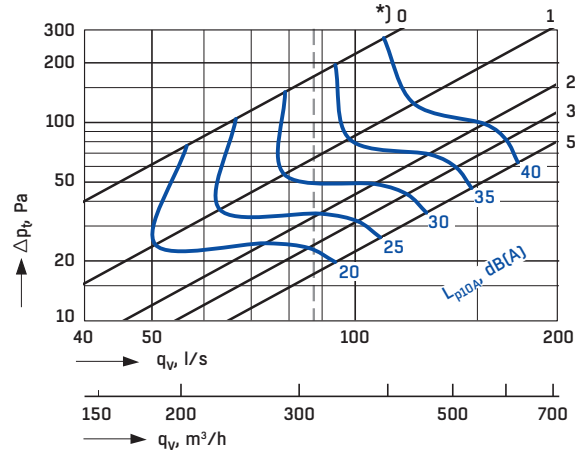
## AIR FLOW, PRESSURE DROP, SOUND LEVEL

### DIFFUSER WITH ACOUSTICALLY INSULATED CONNECTION BOX - SUPPLY AIR

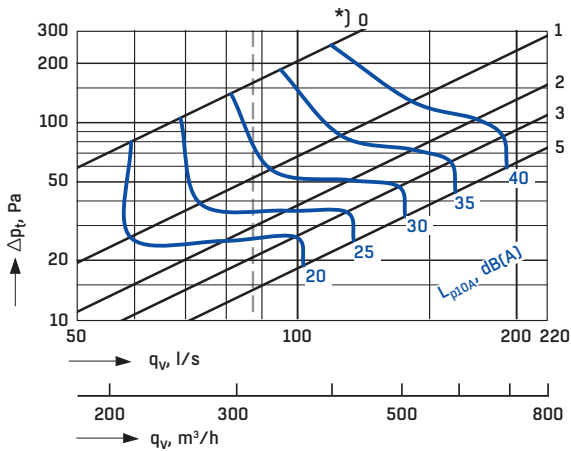
**NWCA-25+SKKA-20-25-1-2**



**NWCA-31+SKKA-25-31-1-2**



**NWCA-35+SKKA-25-35-1-2**



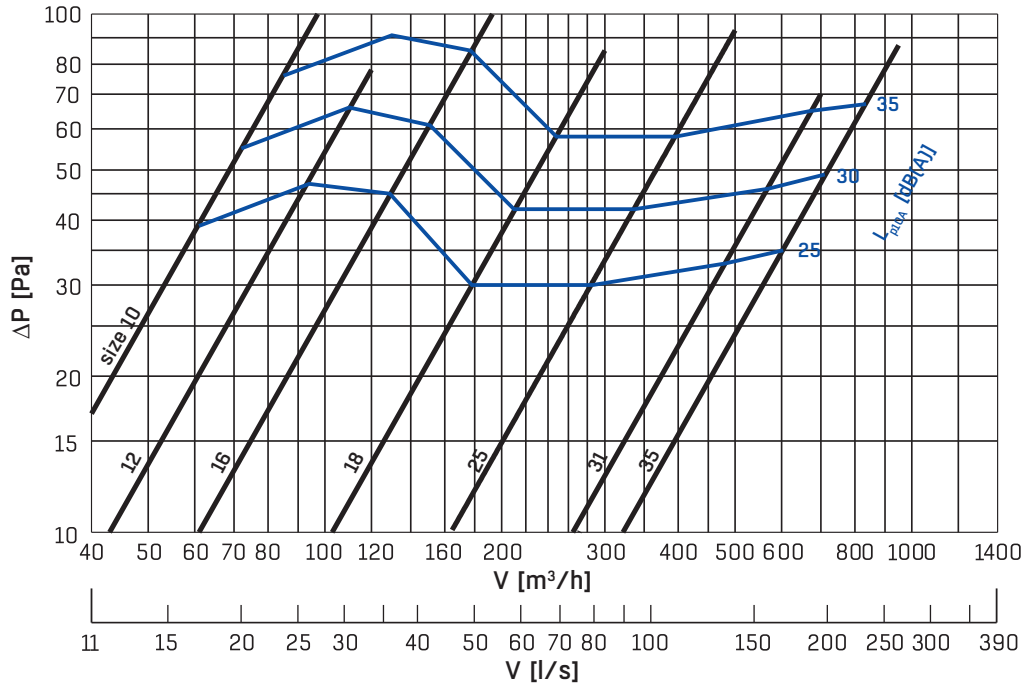
\*) adjustment position

--- Min airflow required to obtain sufficient measuring pressure.

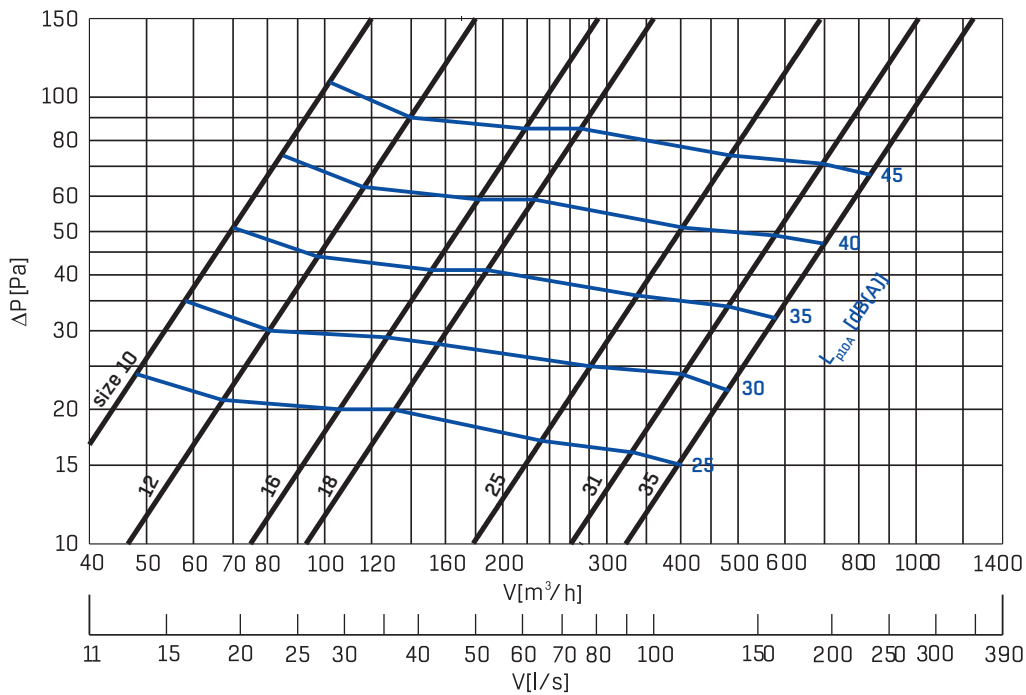
In the above graphs the sound pressure levels are indicated in dB(A) for a reference room with 10 m<sup>2</sup> Sabine room absorption, equivalent to 4 dB room attenuation.

### AIR FLOW, PRESSURE DROP, SOUND LEVEL

#### DIFFUSER WITH PKAA DUCT SOCKET - SUPPLY AIR



#### DIFFUSER WITH PKAA DUCT SOCKET - EXHAUST AIR



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

Maximum temperature difference at heating Δt ≤ 5K  
 Maximum temperature difference at cooling Δt ≤ 12K

## ACOUSTICAL DATA

### SOUND POWER LEVEL

Connection box SKKA (without attenuation material) - Supply air

Size	Correction of sound level $K_{oct}$ in dB for octave bands, mean frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
10	5	5	7	-1	-3	-2	-9	-16
12	9	6	6	-1	0	-4	-12	-13
16	10	8	7	0	-3	-5	-9	-13
18	10	11	3	-1	-1	-4	-10	-14
25	4	8	2	-1	-1	-3	-8	-16
31	7	8	2	-1	0	-3	-8	-17
35	6	8	1	-1	0	-4	-6	-17

Connection box SKKA (with attenuation material) - Supply air

Size	Correction of sound level $K_{oct}$ in dB for octave bands, mean frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
10	5	5	7	0	-3	-4	-9	-16
12	11	8	7	0	-3	-6	-11	-13
16	8	7	8	-1	-2	-6	-10	-13
18	9	9	4	0	-1	-4	-11	-14
25	4	8	3	0	0	-4	-10	-16
31	6	7	1	-1	0	-4	-9	-15
35	7	8	2	0	0	-5	-8	-14

Duct socket PKAA - Supply air

Size	Correction of sound level $K_{oct}$ in dB for octave bands, mean frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
10	9	8	7	4	-7	-10	-15	-25
12	6	5	6	4	-3	-10	-15	-25
16	8	7	6	1	-1	-4	-9	-19
18	9	8	3	4	-3	-6	-11	-21
25	7	6	2	4	-1	-9	-15	-25
31	7	6	2	4	-3	-5	-10	-20
35	10	9	6	1	-1	-6	-11	-19

Duct socket PKAA - Exhaust air

Size	Correction of sound level $K_{oct}$ in dB for octave bands, mean frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
10	5	4	5	5	-14	-15	-19	-25
12	7	5	7	4	-5	-11	-16	-25
16	4	3	4	4	-4	-6	-12	-22
18	10	9	4	2	0	-9	-15	-25
25	10	8	1	4	-1	-11	-17	-25
31	9	7	4	3	-2	-4	-13	-23
35	8	7	1	4	-1	-11	-15	-24

### SOUND ATTENUATION

Connection box SKKA (without attenuation material) - Supply air

Size	Sound attenuation in $\Delta L$ dB for octave bands, mean frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
10	17	21	12	16	16	9	9	11
12	19	20	9	14	15	9	9	10
16	20	13	6	20	8	7	8	10
18	18	11	11	18	5	5	8	9
25	11	7	8	9	6	6	7	10
31	-4	-3	5	6	5	5	7	8
35	-5	-4	5	5	4	5	7	7

Connection box SKKA (with attenuation material) - Supply air

Size	Sound attenuation in $\Delta L$ dB for octave bands, mean frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
10	19	18	12	16	20	14	17	17
12	20	20	10	13	17	13	18	16
16	21	15	7	20	7	13	20	16
18	20	11	11	19	7	9	16	15
25	12	7	7	9	10	11	17	16
31	-3	-3	5	6	6	8	13	10
35	-4	-4	3	6	7	10	15	12

Diffuser without connection box

Size	Sound attenuation in $\Delta L$ dB for octave bands, mean frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
10	0	1	1	7	9	4	2	2
12	1	3	4	8	6	3	1	2
16	1	3	4	7	4	3	2	2
18	2	0	3	5	5	2	0	1
25	3	4	3	7	4	2	3	1
31	2	3	2	10	5	1	2	0
35	4	1	2	5	3	3	2	0

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:

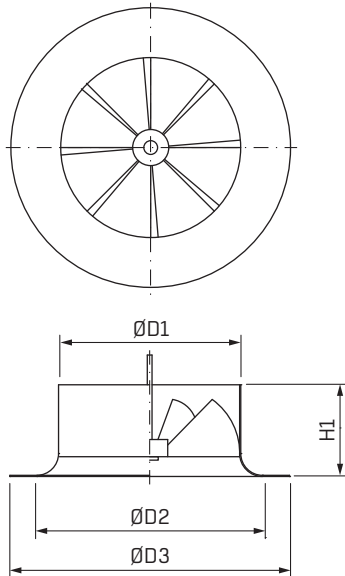
$$L_w = L_{p10A} + K_{oct}$$

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



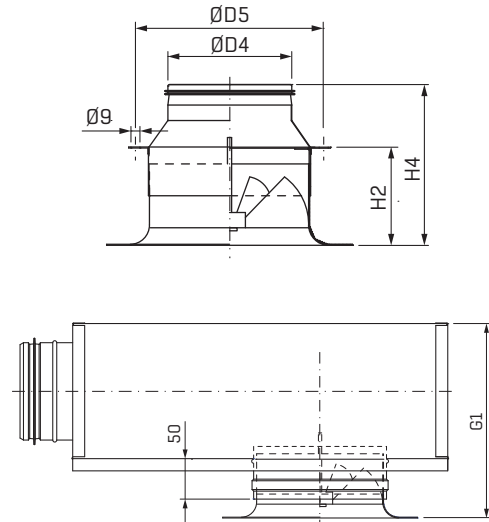
## DIMENSIONS AND WEIGHT

### NWCA SUPPLY AIR DIFFUSER



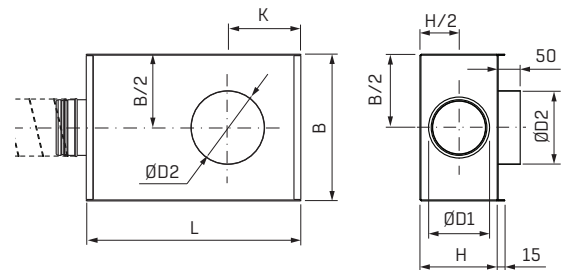
Size	ØD1 (mm)	ØD2 (mm)	ØD3 (mm)	H1 (mm)	Weight (kg)
10	99	128	168	50	0,5
12	124	162	200	80	0,6
16	159	197	244	80	0,7
18	179	217	276	108	1,3
25	249	297	373	112	1,7
31	314	378	463	150	2,7
35	354	430	525	163	3,2

### NWCA + PKAA DUCT SOCKET / SKKA PLENUM BOX



Size	ØD4 (mm)	ØD5 (mm)	H2 (mm)	H4 (mm)	G1 <sub>min</sub> (mm)	G1 <sub>max</sub> (mm)
10-10	100	128	66	120	228	248
10-12	100	153	96	154	235	278
12-16	125	188	96	158	235	278
16-18	160	208	124	178	271	341
20-25	200	278	132	221	334	385
25-31	250	343	166	245	376	472
25-35	250	383	179	304	377	486

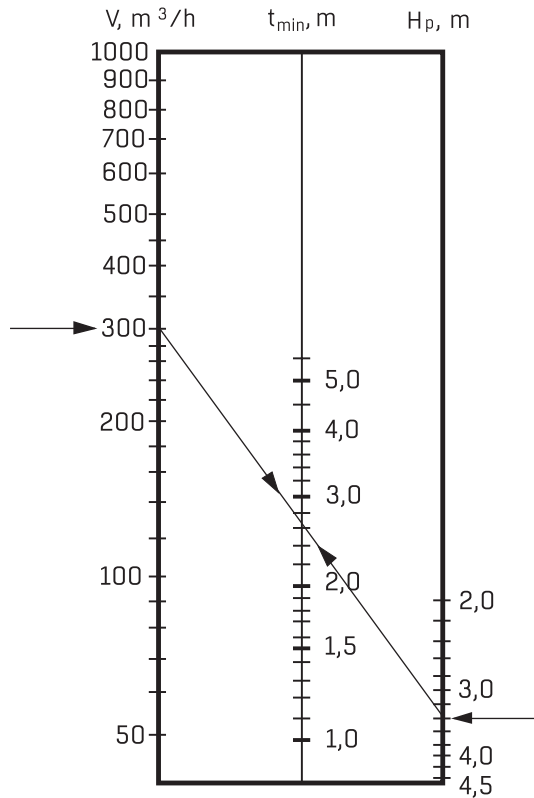
### SKKA PLENUM BOX



Size	ØD1 (mm)	ØD2 (mm)	H (mm)	L (mm)	B (mm)	K (mm)
10-10	100	100	170	320	320	120
10-12	100	125	170	320	320	120
12-16	125	160	170	470	320	160
16-18	160	180	205	500	440	185
20-25	200	250	245	650	480	218
25-31	250	315	295	700	570	260
25-35	250	355	295	700	570	260

## DISTANCE BETWEEN TWO TERMINALS, DEFINITIONS, ADJUSTMENT

### MINIMUM DISTANCE BETWEEN TWO DIFFUSERS



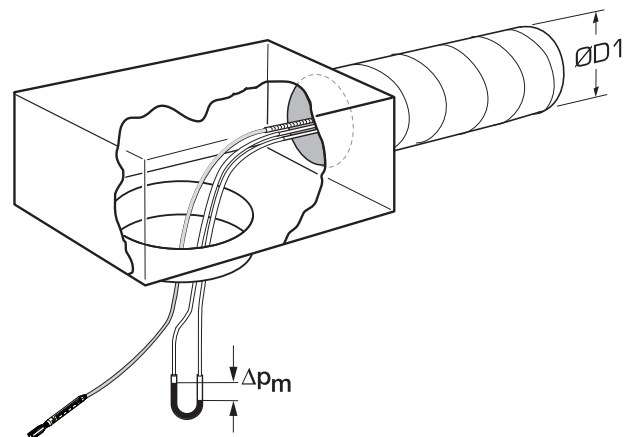
### EXAMPLE

Total air flow, $q_{tot}$	24000 m³/h
Nominal diameter, DN	250 mm
Height above the floor, $H_p$	3.4 m
Number of diffusers, n	80 pcs.
Air flow per diffuser	300 m³/h
Minimum distance between diffusers, $t_{min}$	2.6 m

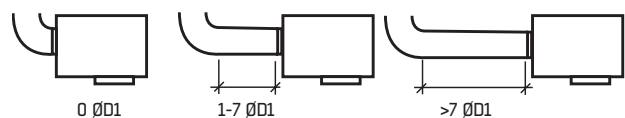
### DEFINITIONS

$q$	air flow	l/s, m³/h
$\Delta p_t$	total pressure drop	Pa
$H_p$	installation height	m
$L_{02}$	throw	m
$L_{p10A}$	sound pressure level with a room attenuation of 4 dB (10 m² room absorption area)	dB(A)
$L_w$	sound power level	dB
$K_{oct}$	octave band correction	dB
$\Delta L$	sound attenuation from the duct to the room	dB

### ADJUSTMENT ZAEF DAMPER



### K-factor - Supply air



$\delta D1$ (mm)	k		
	0 $\delta D1$	1-7 $\delta D1$	>7 $\delta D1$
100	6,0	6,3	5,9
125	10,1	10,6	10,1
160	17,1	19,9	17,3
200	27,1	30,8	27,9
250	47,1	48,8	39,9

## GENERAL

### CONSTRUCTION AND FUNCTION

NWCA is a swirl ceiling supply air terminal that is recommended to be mounted with SKKA connection box or via PKAA duct socket. Design of blades ensures highly effective mixing of the supply air with the air in the premises (high induction rate).

The SKKA plenum box features an extremely quiet patented measurement and adjustment damper ZAEF 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. For installation purposes, SKKA is equipped at the top with a rivet nut size M6 and there are threaded rods attached, cut to specific lengths. Plenum box is available with or without sound attenuation material. In each plenum box, there are lugs attached to the walls for hanging purposes. More information about plenum box may be found in separate technical brochure.

PKAA reducer is supplied with perforated plate inside in order to equalize airflow.

### MATERIAL AND SURFACE FINISH

Both diffuser and the plenum box are made from steel sheet. NWCA 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.

### INSTALLATION, ADJUSTMENT AND MAINTENANCE

The instructions for installation, adjustment and maintenance are available at [www.flaktgroup.com](http://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](http://www.flaktgroup.com).

### SPECIFICATIONS TEXT EXAMPLE

The NWCA is a ceiling supply swirl diffuser available in circular shape of face panel.

The SKKA plenum box includes a quiet, easily removable measurement and adjustment damper (ZAEF) and effective sound attenuation elements. PKAA reducer is supplied with perforated plate inside in order to equalize airflow.

## PRODUCT CODE, ACCESSORIES

### PRODUCT CODE

**Swirl diffuser**

**NWCA-aa-b**

**Size (aa)**

10, 12, 16, 18, 25, 31, 35

**Colour (b)**

1 = standard RAL 9010

X = any other colour from RAL palette

### ACCESSORIES

**Damper**

**BDEP-1-bbb-c**

**Size (bbb)**

010-025

**Model (c)**

1 = standard

### Connection box

**SKKA-aa-bb-c-d**

**Size (aa-bb)**

10-10, 10-12, 12-16, 16-18, 20-25, 25-31, 25-35

(duct connection size - diffuser size)

**Sound attenuation material (c)**

0 = without

1 = with

**Damper (d)**

0 = without

2 = measurement and adjustment damper ZAEF

### Duct socket

**PKAA-aa-bb-c**

**Size (aa-bb)**

10-10, 10-12, 12-16, 16-18, 20-25, 25-31, 25-35

(duct connection size - diffuser size)

**Duct connection type (c)**

1 = with rubber gasket



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NWCA 10152

## **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 Treatment | Air Movement | Air Diffusion | Air Distribution | Air Filtration  
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