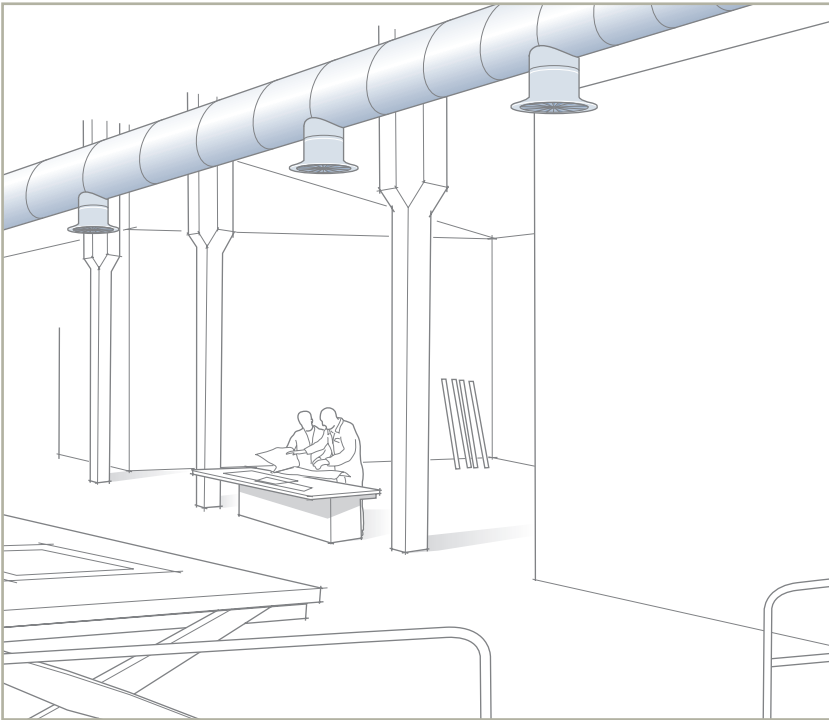


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Swirl diffuser
NWPA
TECHNICAL DATA





Supply swirl diffuser NWPA 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.

NWPA is available in round or square 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_{p10dA} dB(A)
	l/s	m ³ /h		
NWPA-12	11-36	40-130	2,2-3,4	20-38
NWPA-16	17-61	60-220	2,4-4,0	20-41
NWPA-18	21-83	75-300	2,4-4,0	20-43
NWPA-20	28-100	100-360	2,4-4,0	20-44
NWPA-25	39-133	140-480	2,7-4,0	20-42
NWPA-31	56-194	200-700	2,7-4,0	20-42
NWPA-35	111-267	400-960	2,9-4,5	20-50
NWPA-40	139-342	500-1230	2,9-4,5	22-50
NWPA-50	220-560	800-2000	3,0-4,5	30-55

SPECIFICATIONS

- Available in 9 sizes, connections from 125 to 500 mm
- Two connection alternatives, with connection box SKKA or with reducer PKAA
- For supply and exhaust air
- Circular or square shape of face panel

PRODUCT CODE EXAMPLE

Swirl diffuser NWPA-18-1-1

Terminal of size 18 in round design, painted in RAL 9010 colour.

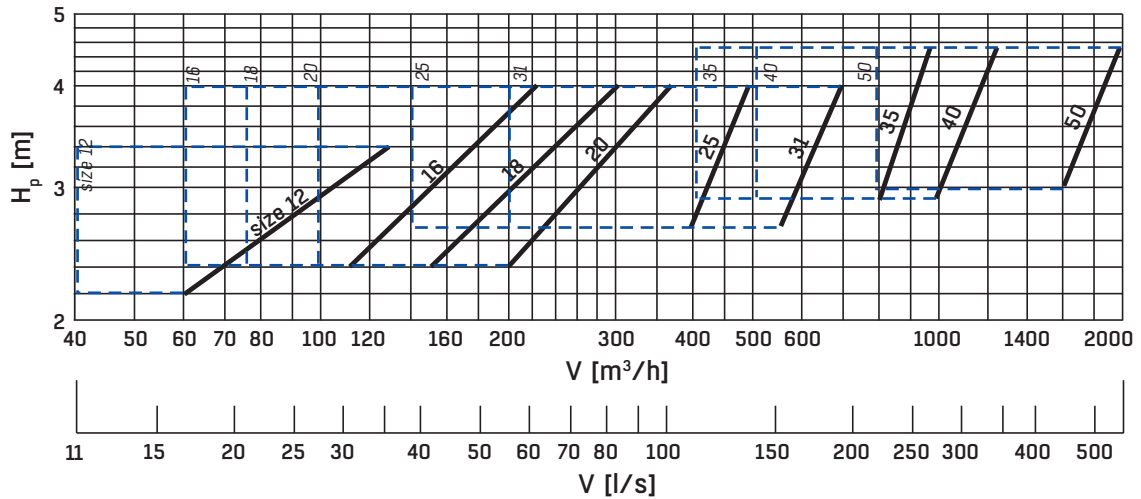
Connection box SKKA-16-18-0-2

Duct connection diameter of 160 mm, diffuser size 18, without sound attenuation material, with ZAEF measurement and adjustment damper.

INSTALLATION HEIGHT, THROW LENGTH

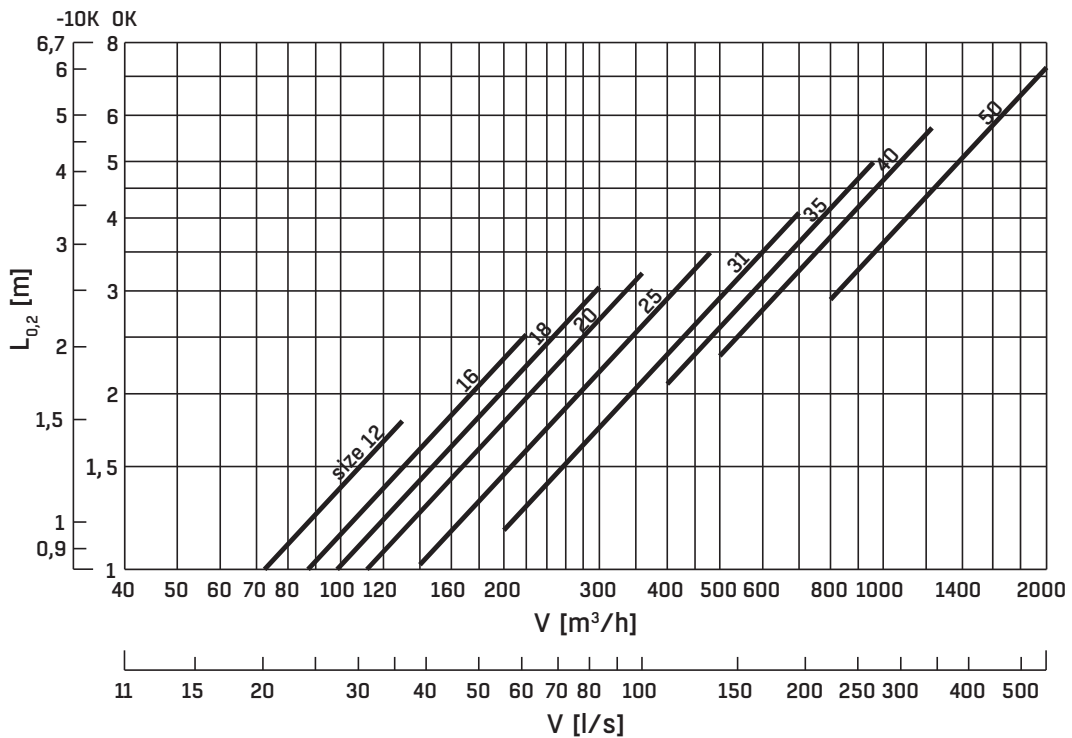
INSTALLATION HEIGHT - SELECTION DIAGRAM

H_p = diffuser installation height above the floor



Above graph shows operating range of diffuser working in cooling mode with $\Delta T = -10K$ with the assumption of velocity in the occupied zone to be less than 0,2 m/s. Vertical dotted line indicates minimum airflow at which stable horizontal diffusion pattern is obtained.

THROW LENGTH

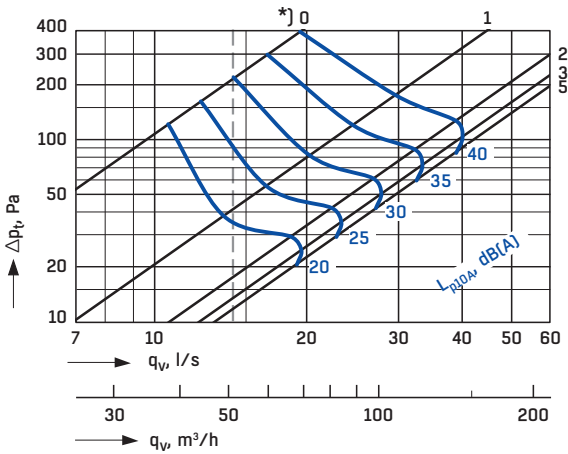


Horizontal throw $L_{0,2}$ has been measured for diffuser installed flush to the ceiling.

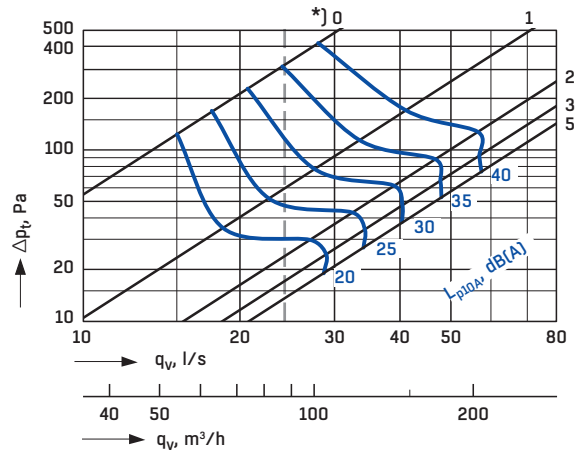
AIR FLOW, PRESSURE DROP, SOUND LEVEL

DIFFUSER WITH ACOUSTICALLY UNINSULATED CONNECTION BOX - SUPPLY AIR

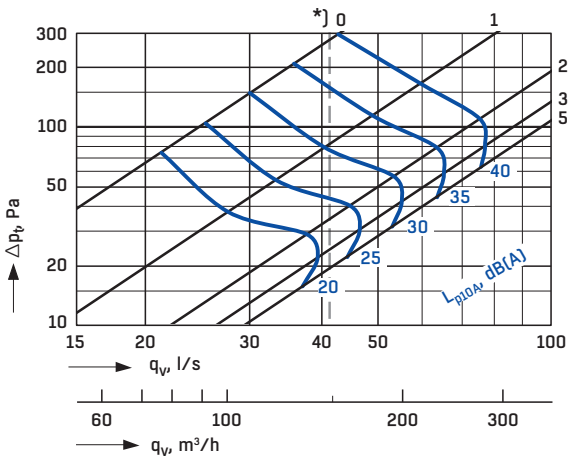
NWPA-12+SKKA-10-12-0-2



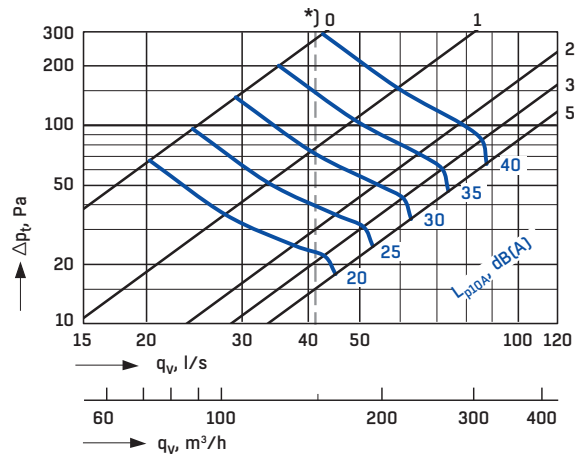
NWPA-16+SKKA-12-16-0-2



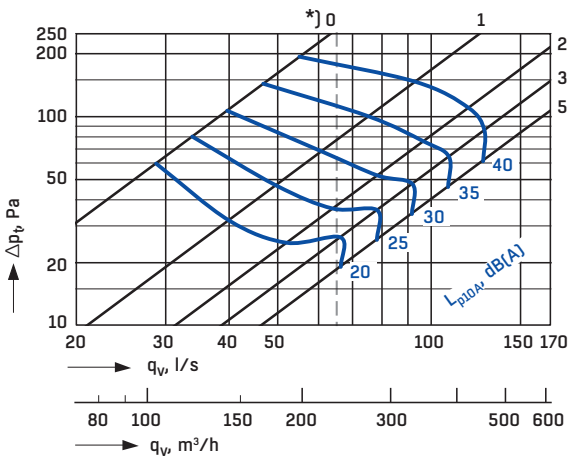
NWPA-18+SKKA-16-18-0-2



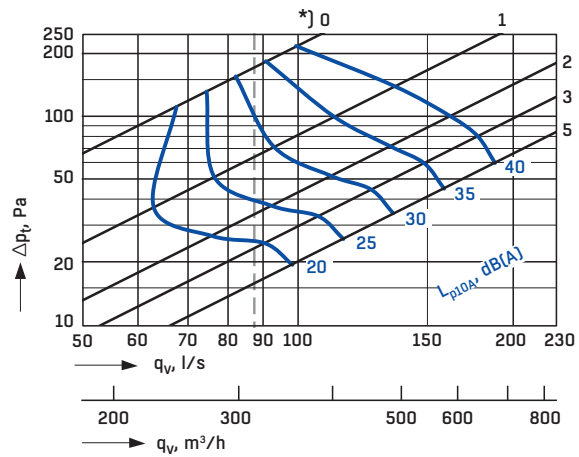
NWPA-20+SKKA-16-20-0-2



NWPA-25+SKKA-20-25-0-2



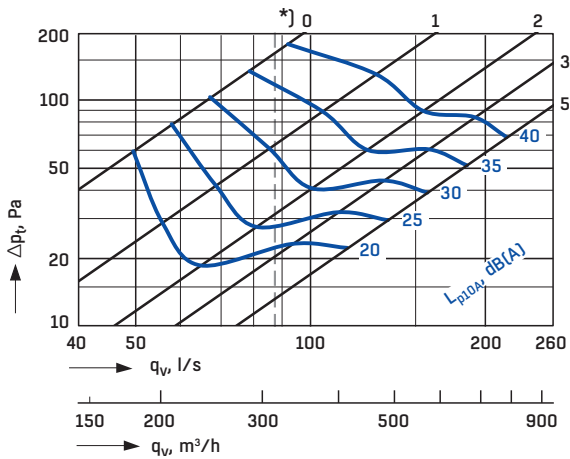
NWPA-31+SKKA-25-31-0-2



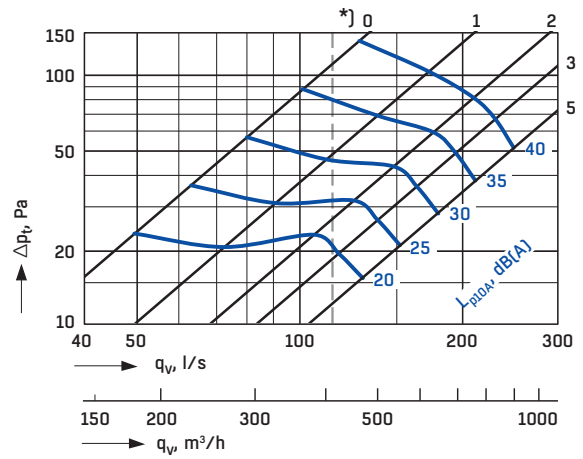
AIR FLOW, PRESSURE DROP, SOUND LEVEL

DIFFUSER WITH ACOUSTICALLY UNINSULATED CONNECTION BOX - SUPPLY AIR

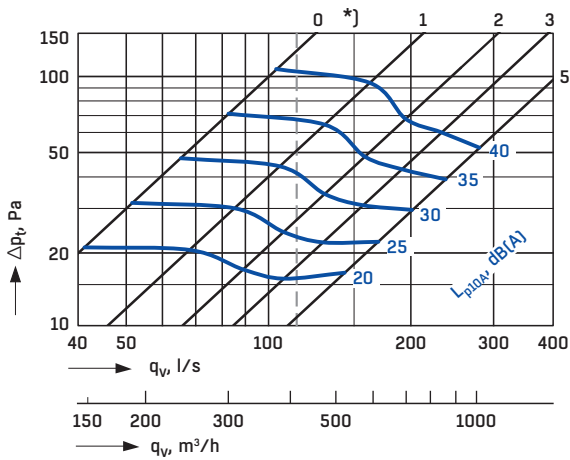
NWPA-35+SKKA-25-35-0-2



NWPA-40+SKKA-31-40-0-2



NWPA-50+SKKA-31-50-0-2



*] adjustment position

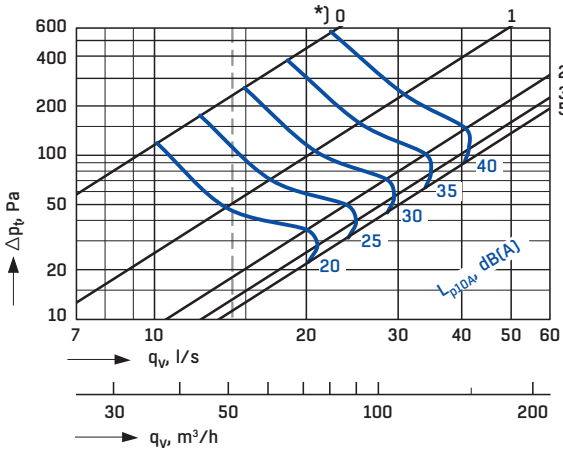
--- Min airflow required to obtain sufficient measuring pressure.

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

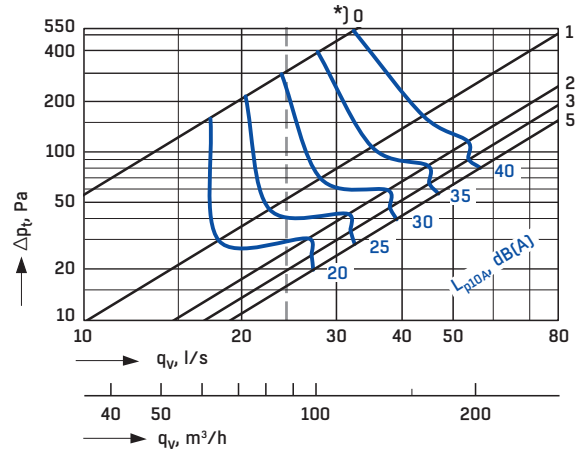
AIR FLOW, PRESSURE DROP, SOUND LEVEL

DIFFUSER WITH ACOUSTICALLY INSULATED CONNECTION BOX - SUPPLY AIR

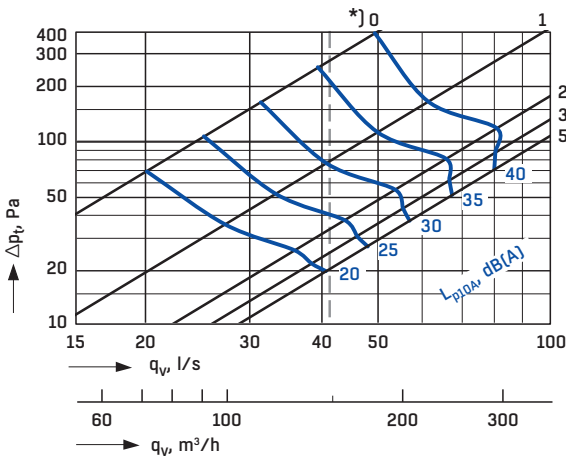
NWPA-12+SKKA-10-12-1-2



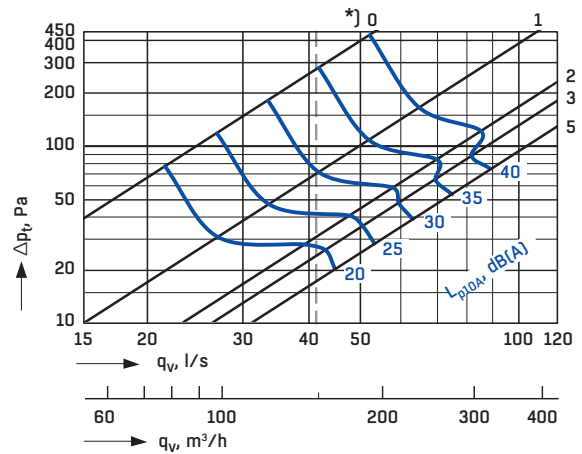
NWPA-16+SKKA-12-16-1-2



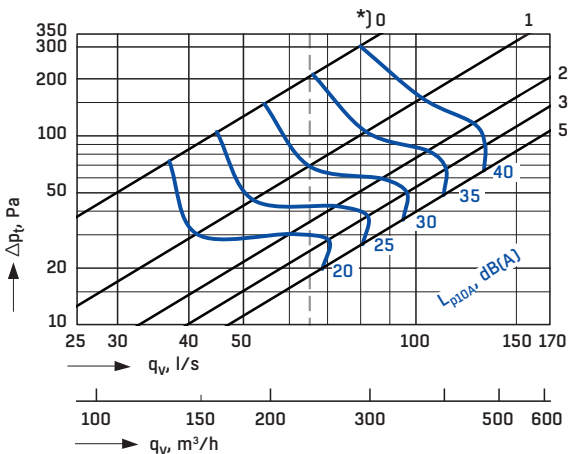
NWPA-18+SKKA-16-18-1-2



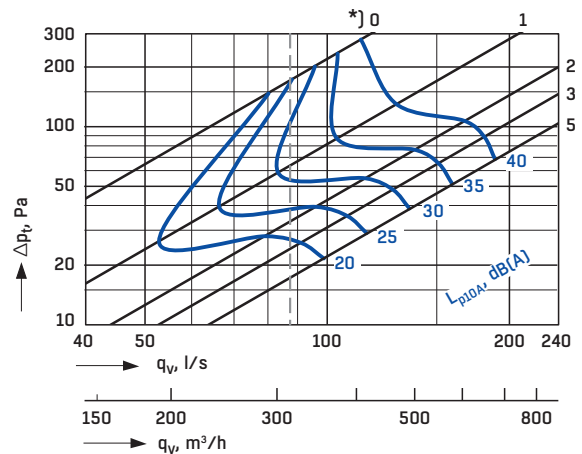
NWPA-20+SKKA-16-20-1-2



NWPA-25+SKKA-20-25-1-2



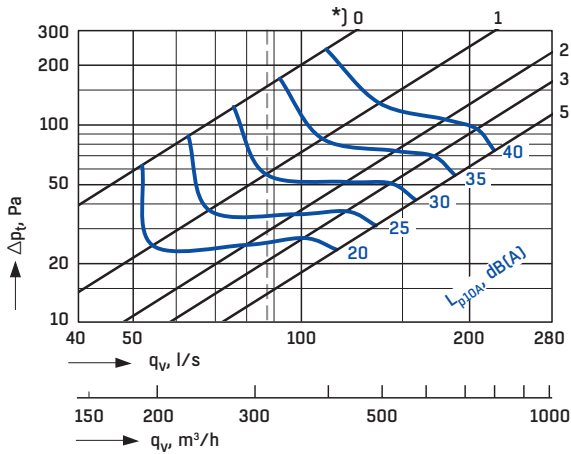
NWPA-31+SKKA-25-31-1-2



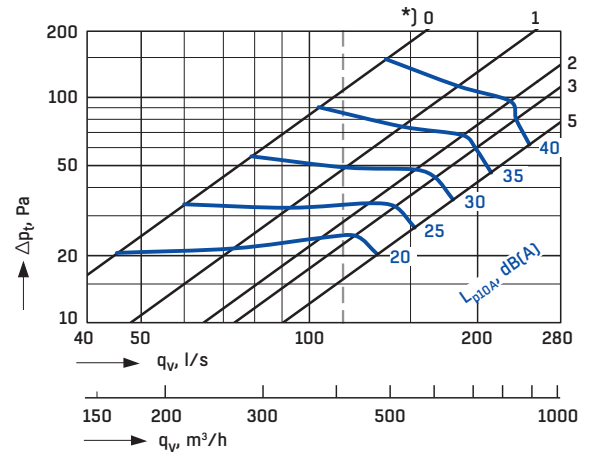
AIR FLOW, PRESSURE DROP, SOUND LEVEL

DIFFUSER WITH ACOUSTICALLY INSULATED CONNECTION BOX - SUPPLY AIR

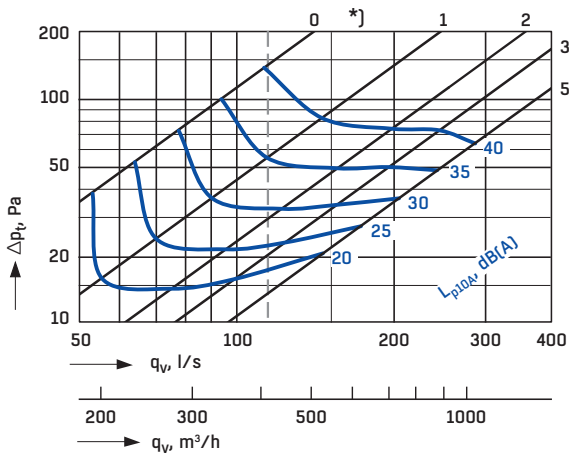
NWPA-35+SKKA-25-35-1-2



NWPA-40+SKKA-31-40-1-2



NWPA-50+SKKA-31-50-1-2



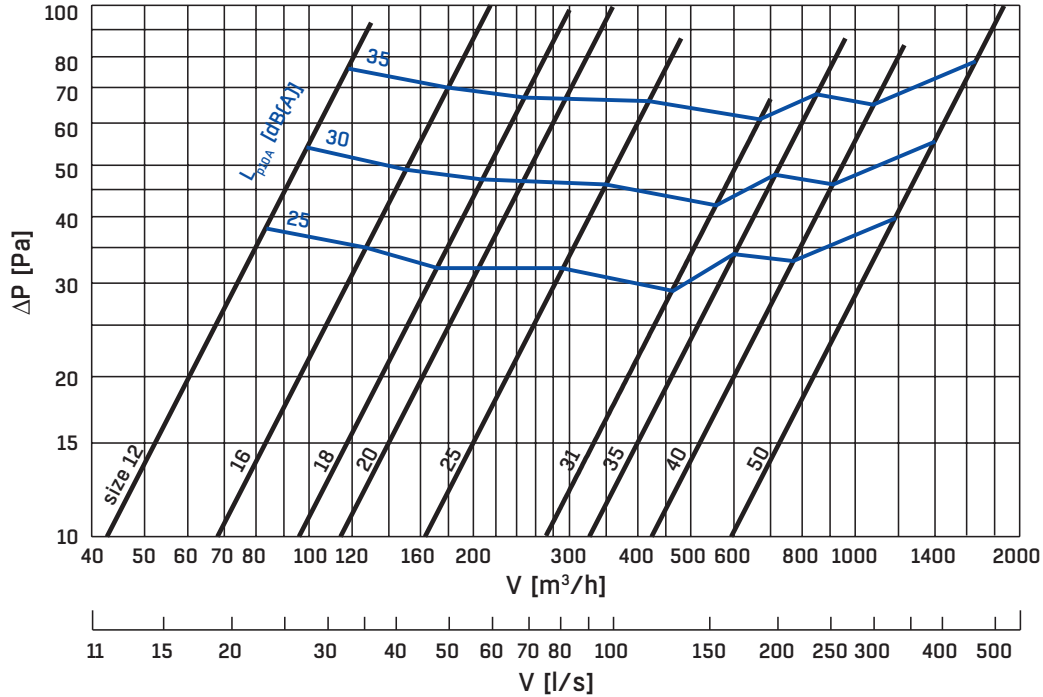
*) adjustment position

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

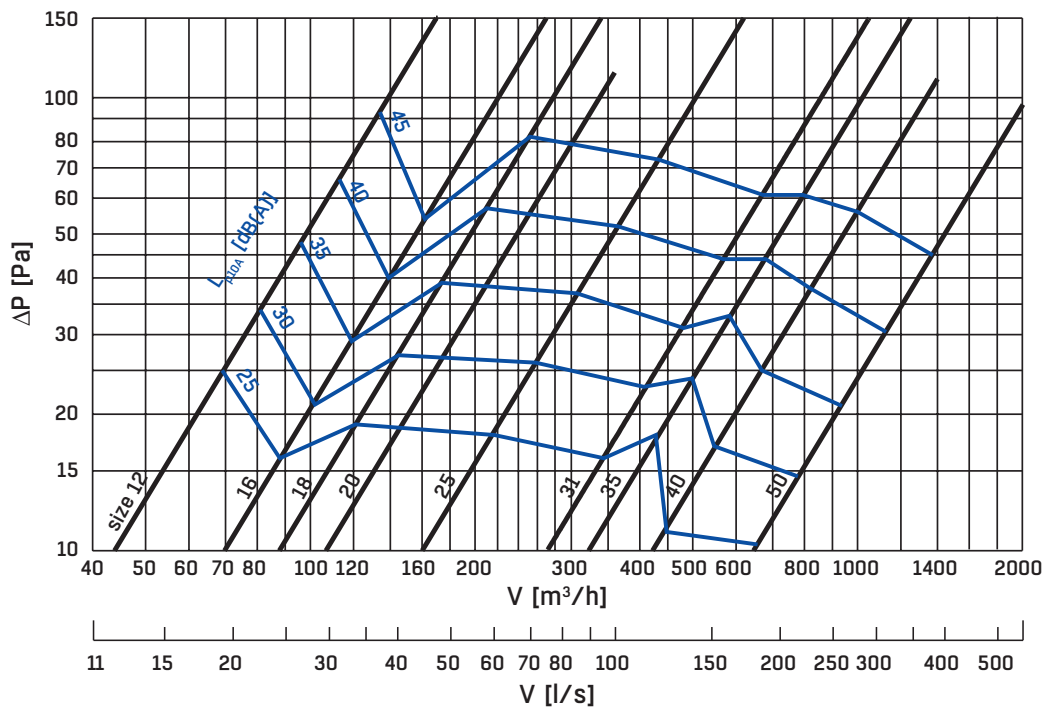
In the above graphs the sound pressure levels are indicated in dB(A) for a reference room with 10 m² Sabine room absorption, equivalent to 4 dB room attenuation.

AIR FLOW, PRESSURE DROP, SOUND LEVEL

DIFFUSER WITH PKAA REDUCER - SUPPLY AIR



DIFFUSER WITH PKAA REDUCER - EXHAUST AIR



In the above graphs 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.

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
12	10	8	7	-1	-2	-6	-11	-13
16	9	8	7	1	-3	-6	-10	-12
18	10	11	5	0	-1	-5	-11	-14
20	10	10	5	0	-2	-4	-9	-13
25	5	7	4	-1	-1	-3	-7	-15
31	8	10	3	0	-2	-3	-8	-17
35	6	9	2	-1	-2	-3	-5	-17
40	8	8	3	0	-2	-3	-7	-17
50	7	6	1	-1	-2	-2	-6	-18

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
12	9	7	7	0	-2	-6	-11	-13
16	7	6	8	1	-3	-7	-10	-12
18	11	9	6	0	-2	-6	-11	-13
20	10	8	6	0	-2	-5	-9	-13
25	4	7	5	0	-1	-5	-8	-14
31	6	8	3	-1	-1	-3	-7	-13
35	6	9	3	0	-1	-4	-7	-13
40	6	8	3	0	-1	-3	-9	-17
50	4	4	0	-2	-2	-2	-4	-14

Reducer 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
12	5	4	3	4	-3	-10	-16	-25
16	7	6	4	4	-1	-10	-16	-24
18	6	5	4	4	-1	-10	-16	-25
20	8	6	5	3	-3	-10	-16	-25
25	10	9	5	3	-5	-11	-17	-25
31	10	9	6	2	-4	-8	-15	-25
35	11	10	5	2	-2	-8	-14	-21
40	9	8	6	3	-4	-7	-13	-25
50	10	8	3	2	-1	-7	-13	-23

Reducer 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
12	5	4	2	2	-2	-4	-10	-20
16	2	1	-3	0	0	-6	-12	-21
18	-2	-3	-2	0	1	-3	-9	-19
20	-3	-3	-2	1	1	-5	-10	-21
25	0	-1	-2	1	1	-6	-12	-20
31	3	2	-1	1	1	-4	-10	-20
35	5	4	-2	0	-1	-4	-11	-19
40	0	-1	-2	0	0	-3	-9	-19
50	2	-2	-1	1	1	-4	-9	-19

SOUND ATTENUATION

Connection box SKKA (without attenuation material) - Supply air

Size	Sound attenuation ΔL in dB for octave bands, mean frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
12	20	19	9	13	15	9	9	10
16	20	13	6	20	8	7	7	10
18	18	10	11	19	7	6	8	9
20	20	10	12	19	5	4	7	9
25	10	6	7	10	6	7	8	11
31	-3	-4	4	6	5	4	6	8
35	-4	-4	3	6	4	3	6	7
40	8	3	7	5	5	4	7	11
50	8	2	4	5	4	4	4	7

Connection box SKKA (with attenuation material) - Supply air

Size	Sound attenuation ΔL in dB for octave bands, mean frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
12	21	19	9	13	16	14	17	16
16	20	14	6	19	10	13	19	16
18	18	11	9	19	8	9	16	15
20	18	11	11	20	6	9	15	14
25	11	7	6	10	10	12	17	16
31	-3	-4	3	7	6	7	14	12
35	-4	-5	2	7	7	8	13	11
40	8	2	6	7	6	8	11	11
50	10	3	6	8	8	10	12	13

Diffuser without connection box

Size	Sound attenuation ΔL in dB for octave bands, mean frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
12	1	3	4	8	6	3	1	2
16	1	3	1	7	4	3	2	2
18	2	0	3	5	5	2	0	1
20	1	1	3	6	5	2	1	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
40	4	1	0	4	6	3	3	2
50	3	3	3	7	3	2	1	1

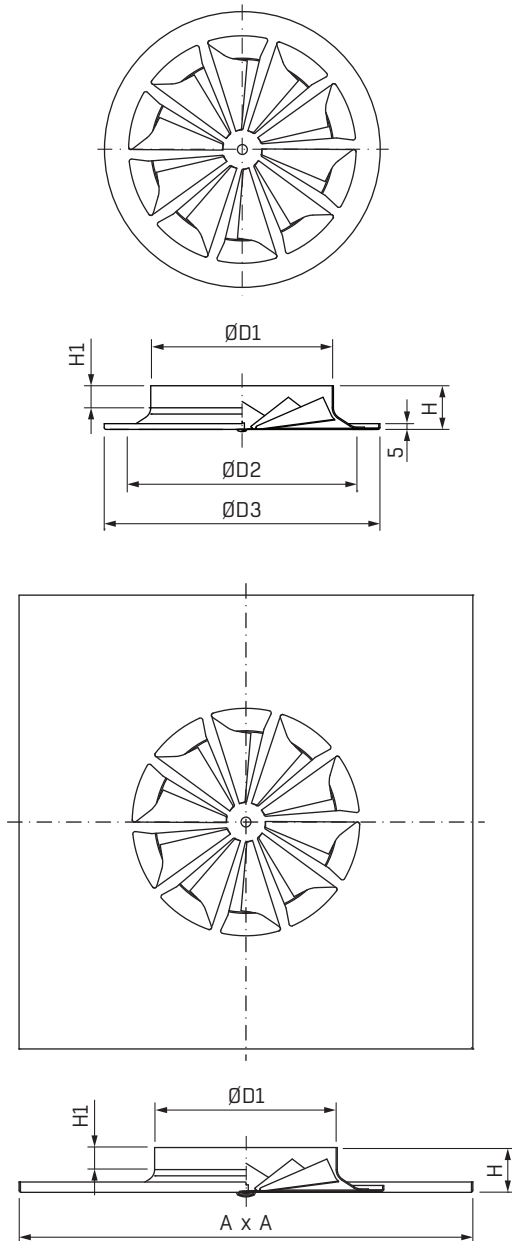
The sound power levels for different octave bands are obtained by adding together the sound pressure level L_{p10A} in dB(A), and the corrections K_{oct} for the octave bands in the table with the help of the following formula:

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

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

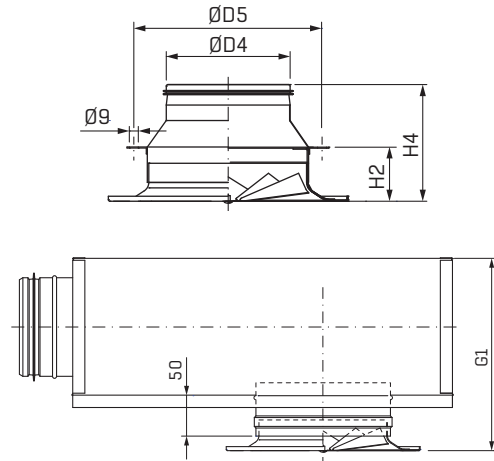
DIMENSIONS AND WEIGHT

NWPA SUPPLY AIR DIFFUSER



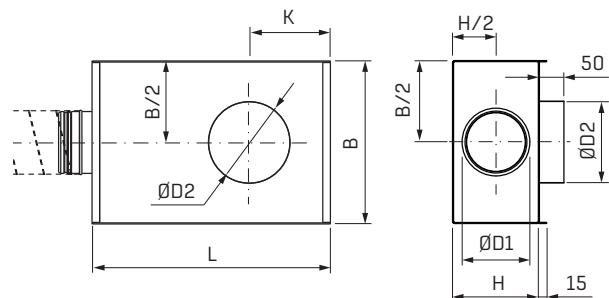
Size	ØD1 (mm)	ØD2 (mm)	ØD3 (mm)	A (mm)	H (mm)	H1 (mm)	Weight (kg)
12	124	165	185	595	36	20	0,4/3,1
16	159	200	240	595	38	20	0,6/3,3
18	179	229	270	595	42	20	0,8/3,4
20	199	249	300	595	47	26	1,0/3,5
25	249	307	375	595	54	31	1,4/3,7
31	314	384	463	595	64	38	1,8/3,8
35	354	436	520	595	58	26	2,4/4,2
40	399	502	598	595	64	27	2,9/4,4
50	499	618	748	595	82	28	3,5

NWPA + PKAA REDUCER / SKKA PLENUM BOX



Size	ØD4 (mm)	ØD5 (mm)	H2 (mm)	H4 (mm)	G1 (mm)
10-12	100	153	52	110	236
12-16	125	188	54	116	238
16-18	160	208	58	124	277
16-20	160	228	57	119	276
20-25	200	278	64	131	318
25-31	250	343	65	144	371
25-35	250	383	87	212	377
31-40	315	428	68	183	382
31-50	315	528	129	294	464

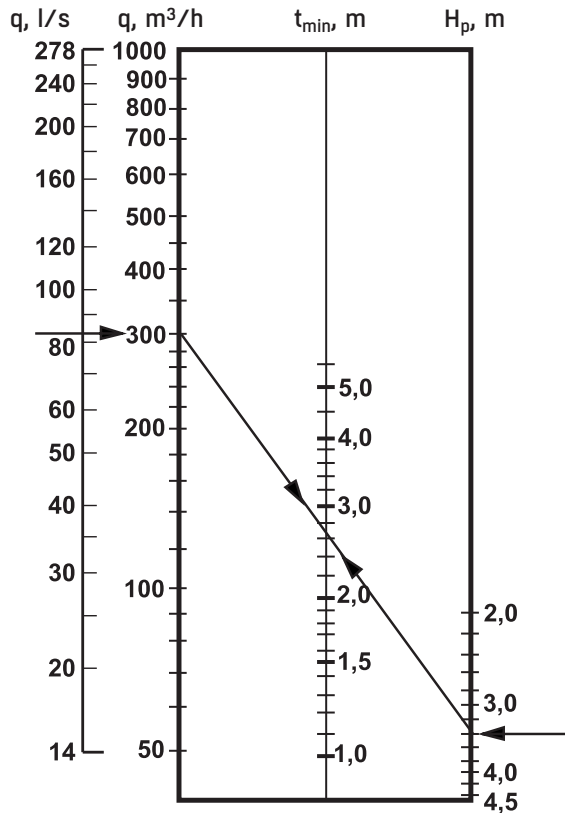
SKKA PLENUM BOX



Size	ØD1 (mm)	ØD2 (mm)	H (mm)	L (mm)	B (mm)	K (mm)
10-12	100	125	170	320	320	120
12-16	125	160	170	470	320	160
16-18	160	180	205	500	440	185
16-20	160	200	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
31-40	315	400	360	700	570	310
31-50	315	500	360	700	570	310

DISTANCE BETWEEN TWO TERMINALS, DEFINITIONS, ADJUSTMENT

MINIMUM DISTANCE BETWEEN TWO TERMINALS



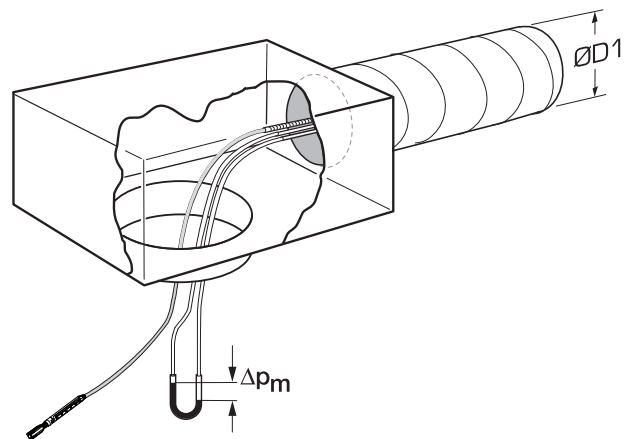
EXAMPLE

Total air flow, q_{tot}	24 000 m ³ /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 m ³ /h
Minimum distance between diffusers, t_{min}	2.6 m

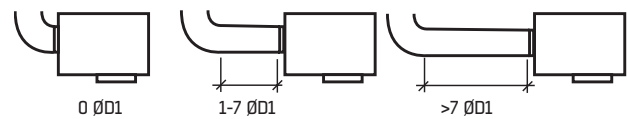
DEFINITIONS

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
ΔL	sound attenuation from the duct to the room	dB

ADJUSTMENT ZAEF DAMPER



K-factor - Supply air



ØD1 (mm)	k		
	0 ØD1	1-7 ØD1	>7 ØD1
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
315	65,9	67,2	64,1

GENERAL

CONSTRUCTION AND FUNCTION

NWPA is a swirl ceiling supply air terminal that is recommended to be mounted with SKKA connection box or via PKAA reducer. Design of blades ensures highly effective mixing of the supply air with the air in the premises (high induction rate). Diffuser is available in either circular or square shape. Square panel fits 600x600mm false ceiling grid.

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 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. NWPA 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

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 NWPA is a ceiling supply swirl diffuser available in circular or square 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

NWPA-aa-b-c

Size (aa)

12, 16, 18, 20, 25, 31, 35, 40, 50

Diffuser design (b)

1 = circular

2 = square (except size 50)

Colour (c)

1 = standard RAL 9010

X = any other colour from RAL palette

Connection box

SKKA-aa-bb-c-d

Size (aa-bb)

10-12, 12-16, 16-18, 16-20, 20-25, 25-31, 25-35, 31-40, 31-50

(duct connection size - diffuser size)

Sound attenuation material (c)

0 = without

1 = with

Damper (d)

0 = without

2 = measurement and adjustment damper ZAEF

Reducer

PKAA-aa-bb-c

Size (aa-bb)

10-12, 12-16, 16-18, 16-20, 20-25, 25-31, 25-35, 31-40, 31-50

(duct connection size - diffuser size)

Duct connection type (c)

1 = with rubber gasket

ACCESSORIES

Damper

BDEP-1-bbb-c

Size (bbb)

010-031

Model (c)

1 = standard

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

Air Treatment | Air Movement | Air Diffusion | Air Distribution | Air Filtration
Air Management & ATD's | Air Conditioning & Heating | Controls | Service

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