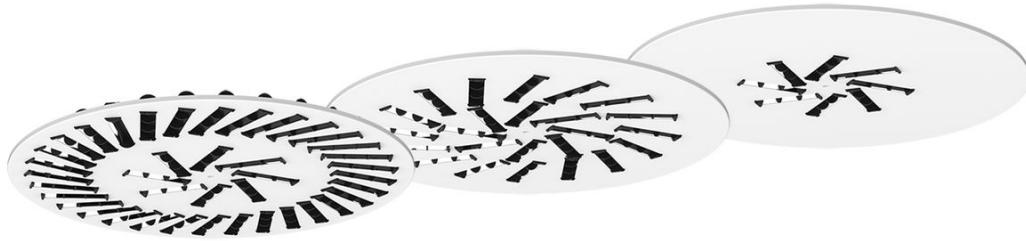


VVKR-A-R
Swirl Diffuser
Handbook



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<u>Dimensions & Weights</u>7
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Description

VVKR-A-R is a swirl diffuser with individually manually adjustable deflectors for installation in ceilings. It is intended for air supply and eventually can be used for exhaust air. The maximum recommended installation height is 4 m. The field of application are buildings like shopping halls, receptions, or offices.

Highlights

- Simple and safe design, easy installation and handling
- Can be used for extracting air with or without deflectors
- Variable air discharge patterns by deflectors adjustable from outside without tools
- Excellent induction rate also at low air flow volumes
- Supply air temperature can vary from -10K to +10K based on the room air temperature

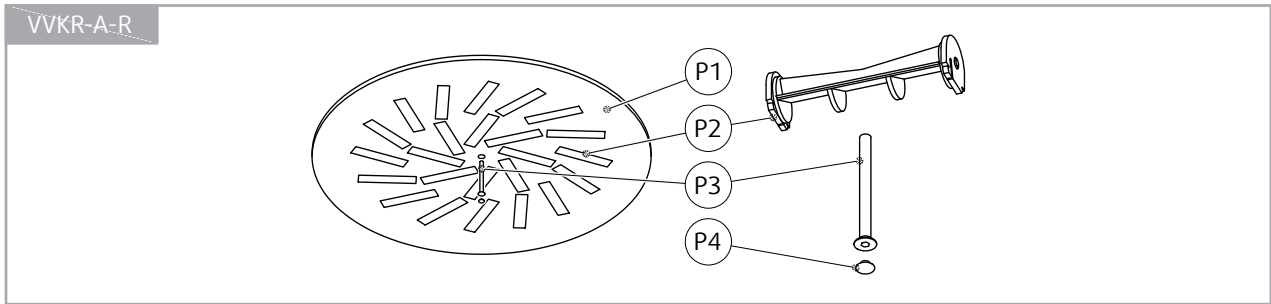
Accessory

- PB-VVK-R: Plenum Box

Design

The VVKR-A-R is made from galvanized steel sheet with powder paint surface finish. The adjustable polymer deflectors are available in black or white colour. In the middle of the diffuser there is a pre-punched hole for front plate screw fixing. A screw with a white decorative cap for its installation is provided together with a self-adhesive seal, which must be adhered at the installation site.

Product Parts



Legend

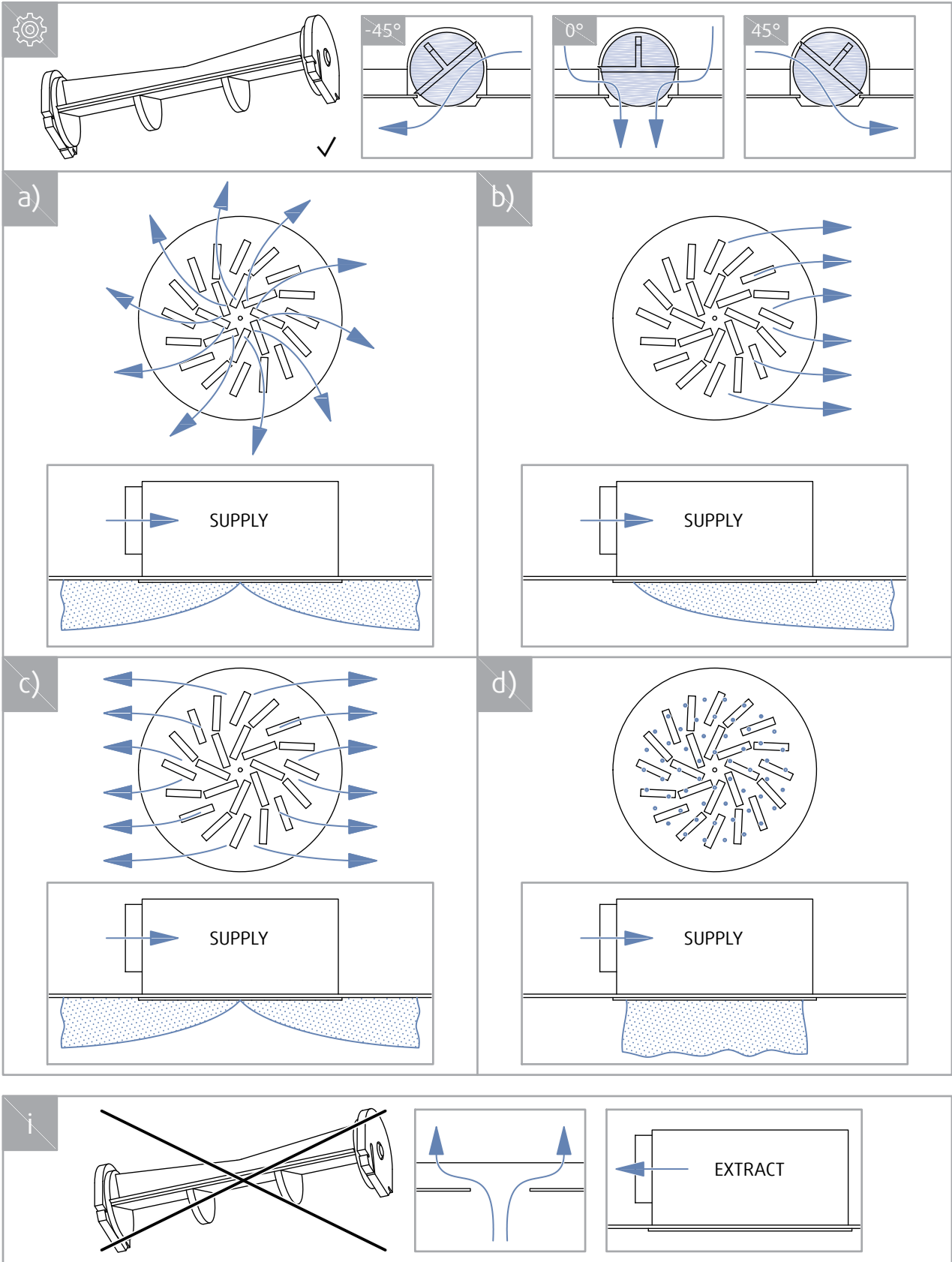
P1 Diffuser plate

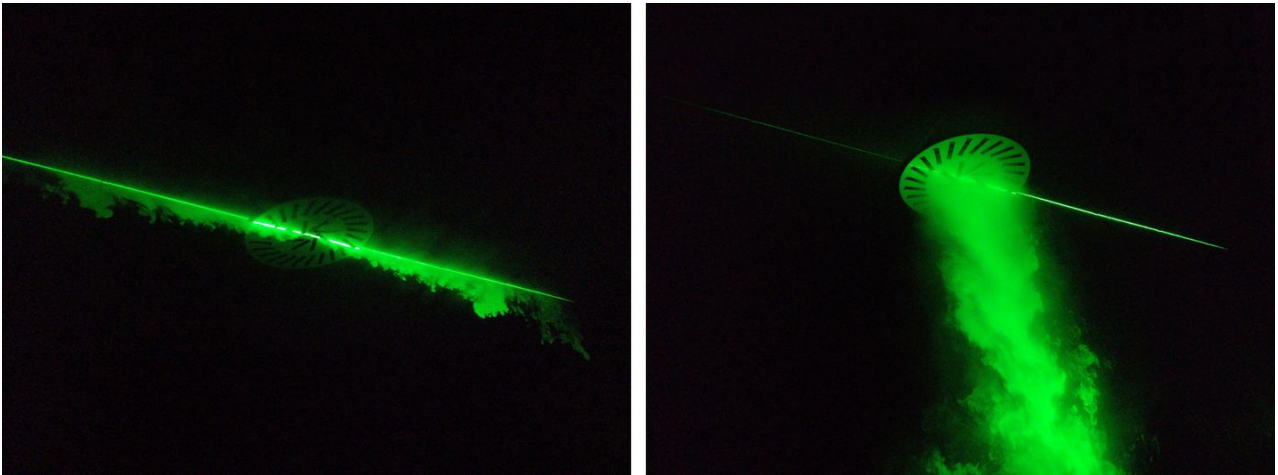
P2 Deflector

P3 Screw M6×70 mm, DIN 7991

P4 Screw cover

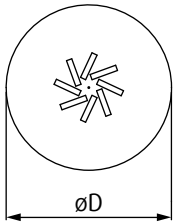
Setup Possibilities



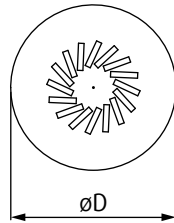


Air flow visualisation of the horizontal and vertical discharge

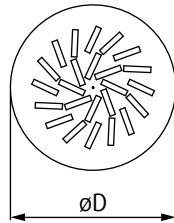
Dimensions & Weights



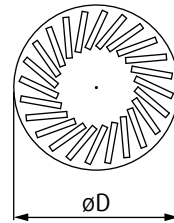
VVKR-A-R...-8



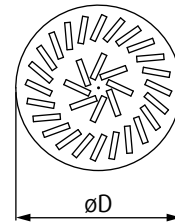
VVKR-A-R...-16



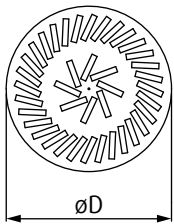
VVKR-A-R...-24



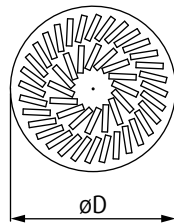
VVKR-A-R...-24C



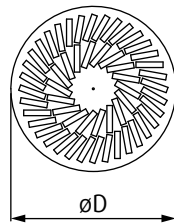
VVKR-A-R...-32



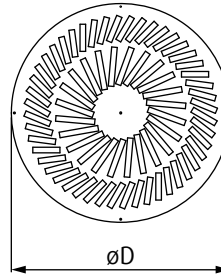
VVKR-A-R...-40



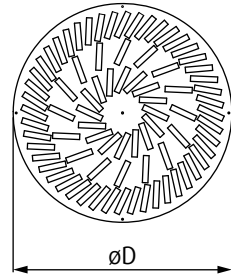
VVKR-A-R...-48



VVKR-A-R-625-54



VVKR-A-R-800-72



VVKR-A-R-825-80

DN	øD	8 ×	16 ×	24 ×	32 ×	40 ×	48 ×	54 ×	72 ×	80 ×
	mm	kg								
300	298	0,5	-	-	-	-	-	-	-	-
400	398	0,9	0,9	-	-	-	-	-	-	-
500	498	1,4	1,4	1,3	-	-	-	-	-	-
600	598	2,7	2,0	1,9	1,9	2,3	1,8	-	-	-
625	623	2,8	2,2	2,1	2,1	2,5	2,6	2,5	-	-
800	798	-	-	-	-	-	-	-	4,3	-
825	823	-	-	-	-	-	-	-	-	4,6

DN ×	A _v	
	m ²	
300×8, 400×8, 500×8, 600×8, 625×8	0,00814	0,01714
400×16, 500×16, 600×16, 625×16	0,01628	0,03427
500×24, 600×24, 625×24	0,02443	0,05141
600×24C, 625×24C	0,03690	0,07424
600×32, 625×32	0,03257	0,06854
600×40, 625×40	0,04071	0,08568
600×48, 625×48	0,04885	0,10282
625×54	0,05496	0,11567
825×80	0,08142	0,17136
800×72	0,08575	0,17706

VVKR-A-R DN	x8		x16			x24			x32			x36			x40		x48		x54		x72		x80		x92		
	PB-VVK-R DN																										
	300	400	500	600	625	400	500	600	625	500	600	625	600	625	500	600	625	600	625	600	625	625	800	825	825		
300	.																										
400	.	.				.																					
500													
600					
625				
800																							.				
825																								.		.	

Ordering Codes

Size DN

300
400
500
600
625
800
825

Number of deflectors

8
16
24
24C
32
40
48
54
64
72
80

Colour of deflectors

B Black
SW Signal white
R Without blades (extract air)

Surface finish

SW Signal white (RAL9003, gloss 30%)
RALXXXX Other RAL colour

Example of the Ordering Code

VVKR-A-R-300-8-W-SW

Swirl diffuser with adjustable deflectors, 300 mm diameter with 8 deflectors. Deflectors and diffuser plate are signal white (SW).

Accessory

PB-VVK-R

Plenum Box



Description

The PB-VVK-R is round face plenum box with a horizontal or a vertical connection and internal or external insulation.

Design

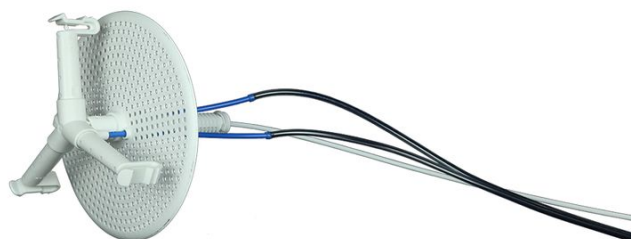
The plenum box is made of galvanized sheet as a standard.

There are 2 types of connection:

- D1: a simple spigot without a seal, with a damper
- D2: a pressed spigot with a seal including the Zeus damper

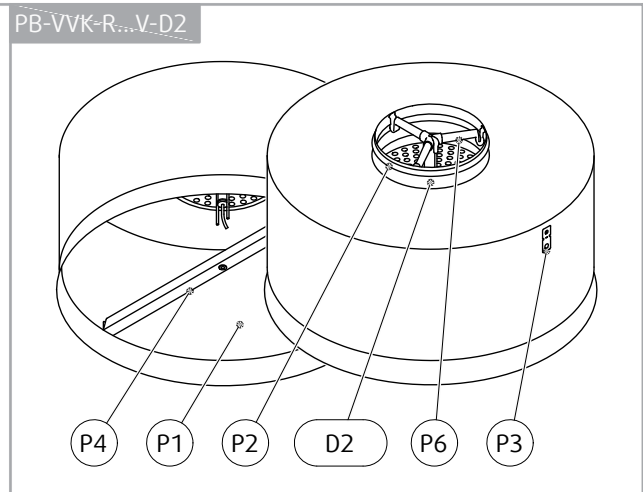
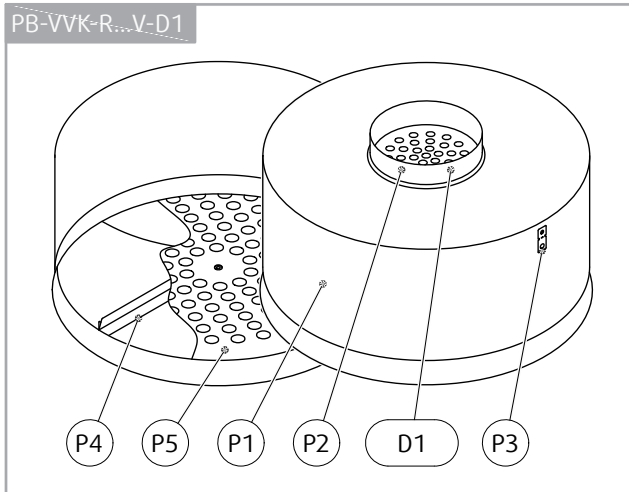
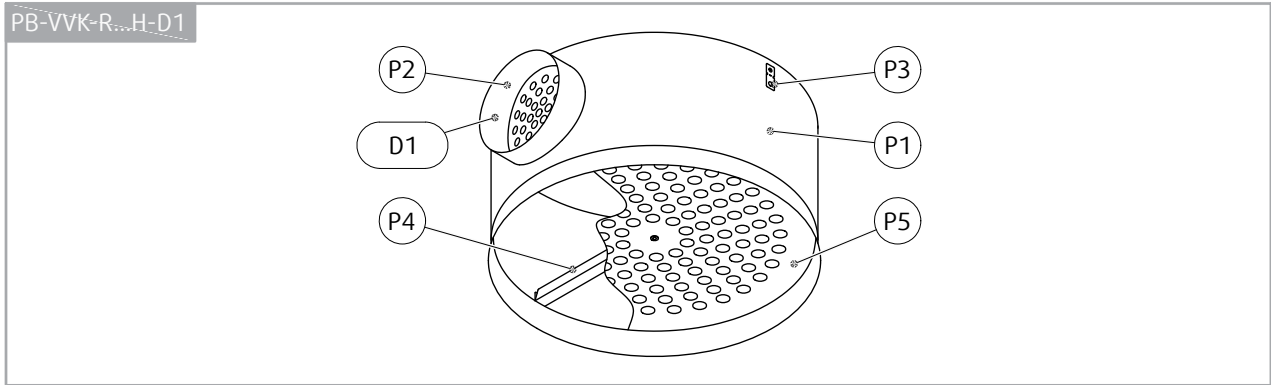
The product can be equipped by 15 mm thick internal insulation and/or 6 mm thick external insulation.

Zeus damper



Zeus is a control damper of the PB-VVK-R...D2 plenum box. It contains impulse tubes for measuring differential pressure using a portable measuring device. It can be adjusted manually using a cable gearing.

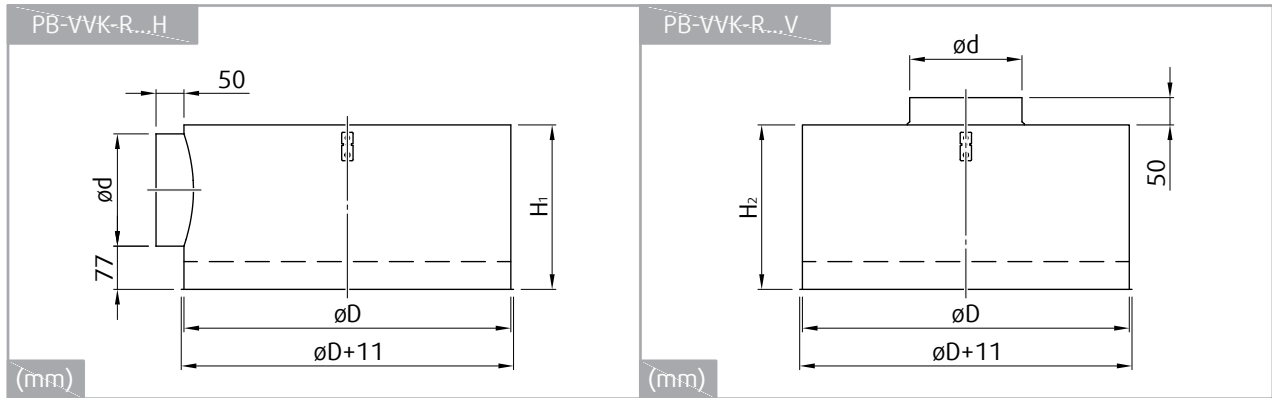
Product Parts



Legend

- P1** Casing (can be equipped by internal/external insulation)
- P2** Duct connection
- D1** Spigot without a seal
- D2** Spigot with a seal including the Zeus damper
- P3** Bendable hanger
- P4** Bridge with a connection to a diffuser
- P5** Mesh screen
- P6** Zeus damper

Dimensions



DN	$\varnothing D$	H_1		H_2		m			
		PB-VVK-R...H		PB-VVK-R...V		PB-VVK-R...H		PB-VVK-R...V	
		mm				kg			
300-160	275	250	200	158	2,29	1,97			
400-200	364	290	200	198	3,34	2,82			
500-200	470	290	200	198	4,68	3,91			
600-200	575	290	300	198	6,21	6,31			
600-250	575	340	300	248	6,68	6,23			
625-200	595	290	300	198	6,52	6,92			
625-250	595	340	300	248	7,00	6,55			
800-315	775	405	300	313	11,35	10,46			
825-315	795	405	300	313	11,83	10,88			

Ordering Codes

Size DN: Inlet-Outlet

300-160

400-200

500-200

600-200

600-250

625-200

625-250

800-315

825-315

Mesh screen

S Supply with mesh screen

E Extract without mesh screen

Connection

H Horizontal (from the side)

V Vertical (from the top)

Damper

D1 Untight spigot with damper ¹

D2 Pressed tight spigot with the Zeus damper ¹

Insulation

I2 With internal insulation ²

J With external insulation ²

NOTES:

¹ If the spigot type is not entered in the ordering code, type "D1" will be supplied by default. It is not possible to order the Zeus damper for the product PB-VVK-R with horizontal connection. Plenum boxes with a vertical spigot D2 are supplied without a mesh screen.

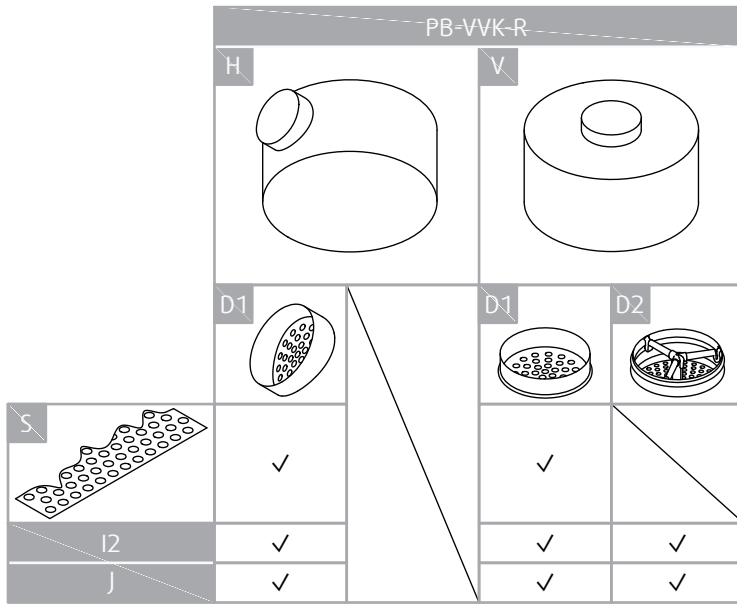
² The internal and external insulation also can be applied together. In case the insulation type is not entered in the ordering code, the product PB-VVK-R will be supplied without insulation.

Example of the Ordering Code

PB-VVK-R-300-160-E-H-D1-I2

Round plenum box with nominal dimension 300 mm, spigot with diameter 160 mm, extract without mesh screen, horizontal connection (from the side), spigot type D1, internal insulation.

Plenum box selection diagram



Quick Selection

Air flow volume q_v at different A-weighted sound power levels L_{WA}

Item	25 dB(A)		30 dB(A)		35 dB(A)	
	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s
VVKR-A-R-300-8-B-SW + PB-VVK-R-300-160-S-H-D1	143	40	172	48	207	57
VVKR-A-R-400-8-B-SW + PB-VVK-R-300-160-S-H-D1 / PB-VVK-R-400-200-S-H-D1	143	40	172	48	207	57
VVKR-A-R-400-16-B-SW + PB-VVK-R-400-200-S-H-D1	229	64	274	76	327	91
VVKR-A-R-500-8-B-SW + PB-VVK-R-300-160-S-H-D1 / PB-VVK-R-400-200-S-H-D1 / PB-VVK-R-500-200-S-H-D1	143	40	172	48	207	57
VVKR-A-R-500-16-B-SW + PB-VVK-R-400-200-S-H-D1 / PB-VVK-R-500-200-S-H-D1	229	64	274	76	327	91
VVKR-A-R-500-24-B-SW + PB-VVK-R-500-200-S-H-D1	277	77	329	91	391	109
VVKR-A-R-600-8-B-SW + PB-VVK-R-300-160-S-H-D1 / PB-VVK-R-400-200-S-H-D1 / PB-VVK-R-500-200-S-H-D1 / PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1	143	40	172	48	207	57
VVKR-A-R-600-16-B-SW + PB-VVK-R-400-200-S-H-D1 / PB-VVK-R-500-200-S-H-D1 / PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1	229	64	274	76	327	91
VVKR-A-R-600-24-B-SW + PB-VVK-R-500-200-S-H-D1 / PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1	277	77	329	91	391	109
VVKR-A-R-600-24C-B-SW + PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1	412	115	504	140	612	170
VVKR-A-R-600-32-B-SW + PB-VVK-R-600-200-S-H-D1	408	113	493	137	592	165
VVKR-A-R-600-32-B-SW + PB-VVK-R-600-250-S-H-D1	391	109	465	129	551	153
VVKR-A-R-600-40-B-SW + PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1	458	127	545	151	644	179
VVKR-A-R-600-48-B-SW + PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1	490	136	577	160	677	188
VVKR-A-R-625-8-B-SW + PB-VVK-R-300-160-S-H-D1 / PB-VVK-R-400-200-S-H-D1 / PB-VVK-R-500-200-S-H-D1 / PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1 / PB-VVK-R-625-200-S-H-D1 / PB-VVK-R-625-250-S-H-D1	143	40	172	48	207	57
VVKR-A-R-625-16-B-SW + PB-VVK-R-400-200-S-H-D1 / PB-VVK-R-500-200-S-H-D1 / PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1 / PB-VVK-R-625-200-S-H-D1 / PB-VVK-R-625-250-S-H-D1	229	64	274	76	327	91
VVKR-A-R-625-24-B-SW + PB-VVK-R-500-200-S-H-D1 / PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1 / PB-VVK-R-625-200-S-H-D1 / PB-VVK-R-625-250-S-H-D1	277	77	329	91	391	109
VVKR-A-R-625-24C-B-SW + PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1 / PB-VVK-R-625-200-S-H-D1 / PB-VVK-R-625-250-S-H-D1	412	115	504	140	612	170
VVKR-A-R-625-32-B-SW + PB-VVK-R-600-200-S-H-D1	408	113	493	137	592	165

Item	25 dB(A)		30 dB(A)		35 dB(A)	
	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s
VVKR-A-R-625-32-B-SW + PB-VVK-R-600-250-S-H-D1	391	109	465	129	551	153
VVKR-A-R-625-32-B-SW + PB-VVK-R-625-200-S-H-D1	408	113	493	137	592	165
VVKR-A-R-625-32-B-SW + PB-VVK-R-625-250-S-H-D1	391	109	465	129	551	153
VVKR-A-R-625-40-B-SW + PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1 / PB-VVK-R-625-200-S-H-D1 / PB-VVK-R-625-250-S-H-D1	458	127	545	151	644	179
VVKR-A-R-625-48-B-SW + PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1 / PB-VVK-R-625-200-S-H-D1 / PB-VVK-R-625-250-S-H-D1	490	136	577	160	677	188
VVKR-A-R-625-54-B-SW + PB-VVK-R-625-200-S-H-D1 / PB-VVK-R-625-250-S-H-D1	600	167	697	193	806	224
VVKR-A-R-800-72-B-SW + PB-VVK-R-800-315-S-H-D1	679	189	805	224	949	264
VVKR-A-R-825-80-B-SW + PB-VVK-R-825-315-S-H-D1	679	189	805	224	949	264

NOTE: The working points were measured with open adjustment damper.

Air flow volume q_v at different A-weighted sound pressure levels L_{pA} with 10m² absorption area

Item	20 dB(A)		25 dB(A)		30 dB(A)	
	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s
VVKR-A-R-300-8-B-SW + PB-VVK-R-300-160-S-H-D1	137	38	166	46	200	55
VVKR-A-R-400-8-B-SW + PB-VVK-R-300-160-S-H-D1 / PB-VVK-R-400-200-S-H-D1	137	38	166	46	200	55
VVKR-A-R-400-16-B-SW + PB-VVK-R-400-200-S-H-D1	221	61	265	74	316	88
VVKR-A-R-500-8-B-SW + PB-VVK-R-300-160-S-H-D1 / PB-VVK-R-400-200-S-H-D1 / PB-VVK-R-500-200-S-H-D1	137	38	166	46	200	55
VVKR-A-R-500-16-B-SW + PB-VVK-R-400-200-S-H-D1 / PB-VVK-R-500-200-S-H-D1	221	61	265	74	316	88
VVKR-A-R-500-24-B-SW + PB-VVK-R-500-200-S-H-D1	267	74	318	88	378	105
VVKR-A-R-600-8-B-SW + PB-VVK-R-300-160-S-H-D1 / PB-VVK-R-400-200-S-H-D1 / PB-VVK-R-500-200-S-H-D1 / PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1	137	38	166	46	200	55
VVKR-A-R-600-16-B-SW + PB-VVK-R-400-200-S-H-D1 / PB-VVK-R-500-200-S-H-D1 / PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1	221	61	265	74	316	88
VVKR-A-R-600-24-B-SW + PB-VVK-R-500-200-S-H-D1 / PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1	267	74	318	88	378	105
VVKR-A-R-600-24C-B-SW + PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1	396	110	484	135	589	164
VVKR-A-R-600-32-B-SW + PB-VVK-R-600-200-S-H-D1	393	109	475	132	571	159
VVKR-A-R-600-32-B-SW + PB-VVK-R-600-250-S-H-D1	377	105	449	125	532	148
VVKR-A-R-600-40-B-SW + PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1	442	123	527	146	623	173
VVKR-A-R-600-48-B-SW + PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1	474	132	559	155	656	182
VVKR-A-R-625-8-B-SW + PB-VVK-R-300-160-S-H-D1 / PB-VVK-R-400-200-S-H-D1 / PB-VVK-R-500-200-S-H-D1 / PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1 / PB-VVK-R-625-200-S-H-D1 / PB-VVK-R-625-250-S-H-D1	137	38	166	46	200	55
VVKR-A-R-625-16-B-SW + PB-VVK-R-400-200-S-H-D1 / PB-VVK-R-500-200-S-H-D1 / PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1 / PB-VVK-R-625-200-S-H-D1 / PB-VVK-R-625-250-S-H-D1	221	61	265	74	316	88
VVKR-A-R-625-24-B-SW + PB-VVK-R-500-200-S-H-D1 / PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1 / PB-VVK-R-625-200-S-H-D1 / PB-VVK-R-625-250-S-H-D1	267	74	318	88	378	105
VVKR-A-R-625-24C-B-SW + PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1 / PB-VVK-R-625-200-S-H-D1 / PB-VVK-R-625-250-S-H-D1	396	110	484	135	589	164
VVKR-A-R-625-32-B-SW + PB-VVK-R-600-200-S-H-D1	393	109	475	132	571	159
VVKR-A-R-625-32-B-SW + PB-VVK-R-600-250-S-H-D1	377	105	449	125	532	148
VVKR-A-R-625-32-B-SW + PB-VVK-R-625-200-S-H-D1	393	109	475	132	571	159

Item	20 dB(A)		25 dB(A)		30 dB(A)	
	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s
VVKR-A-R-625-32-B-SW + PB-VVK-R-625-250-S-H-D1	377	105	449	125	532	148
VVKR-A-R-625-40-B-SW + PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1 / PB-VVK-R-625-200-S-H- D1 / PB-VVK-R-625-250-S-H-D1	442	123	527	146	623	173
VVKR-A-R-625-48-B-SW + PB-VVK-R-600-200-S-H-D1 / PB-VVK-R-600-250-S-H-D1 / PB-VVK-R-625-200-S-H- D1 / PB-VVK-R-625-250-S-H-D1	474	132	559	155	656	182
VVKR-A-R-625-54-B-SW + PB-VVK-R-625-200-S-H-D1 / PB-VVK-R-625-250-S-H-D1	582	162	676	188	783	217
VVKR-A-R-800-72-B-SW + PB-VVK-R-800-315-S-H-D1	656	182	778	216	918	255
VVKR-A-R-825-80-B-SW + PB-VVK-R-825-315-S-H-D1	656	182	778	216	918	255

NOTE: The working points were measured with open adjustment damper.

Technical Parameters

Legend

$L_{0,2}$ (m) Air throw length with terminal velocity 0,2 m/s

L_x (m) Air throw length calculated for specific terminal velocity

x (m/s) Terminal velocity in range of 0,1 m/s ... 1 m/s

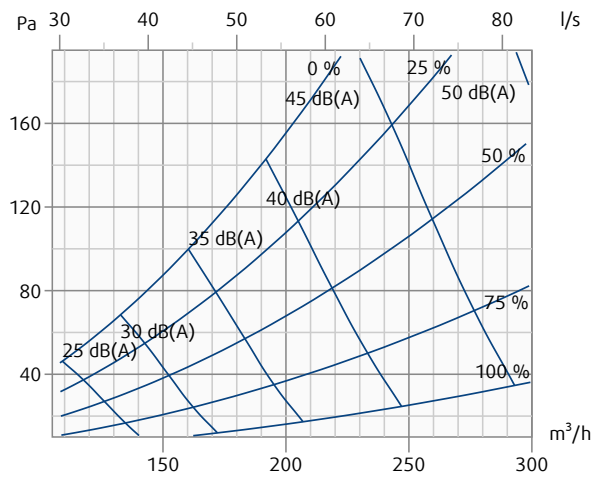
0%, 25%, 50%, 75%, 100% The plenum box damper positions in pressure drop/noise diagrams are represented as percentage. 0% is full damper restriction. 100% is fully open damper.

Calculation of Air Throw for Different Terminal Velocities

$$L_x = L_{0,2} \cdot 0,2/x$$

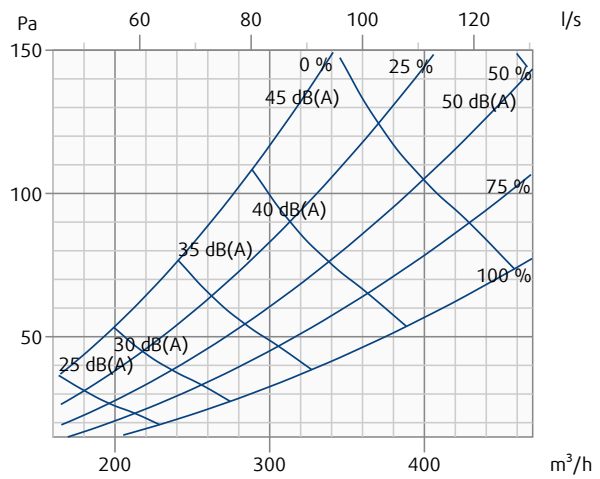
VVKR-A-R-300-8-B-SW + PB-VVK-R-300-160-S-H-D1

Pressure drop & A-weighted sound power level in dB(A)



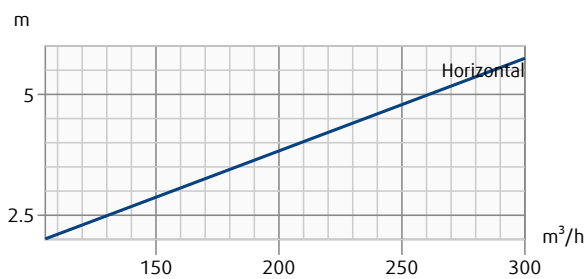
VVKR-A-R-400-16-B-SW + PB-VVK-R-400-200-S-H-D1

Pressure drop & A-weighted sound power level in dB(A)



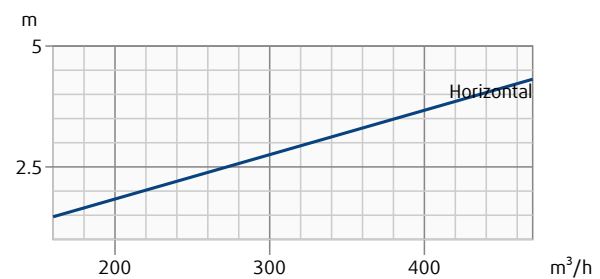
VVKR-A-R-300-8-B-SW + PB-VVK-R-300-160-S-H-D1

Throw length (terminal velocity 0.2 m/s)



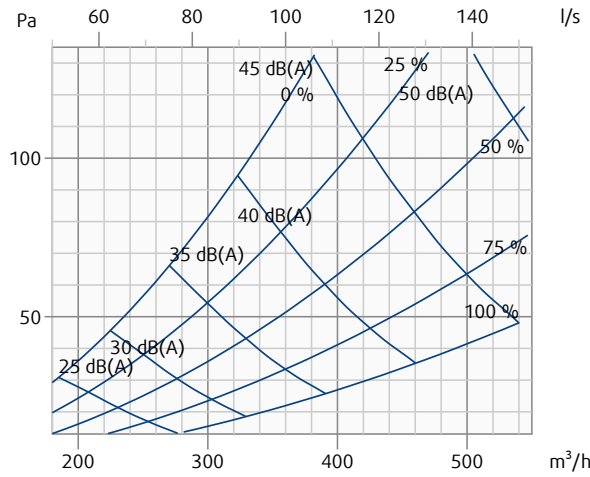
VVKR-A-R-400-16-B-SW + PB-VVK-R-400-200-S-H-D1

Throw length (terminal velocity 0.2 m/s)



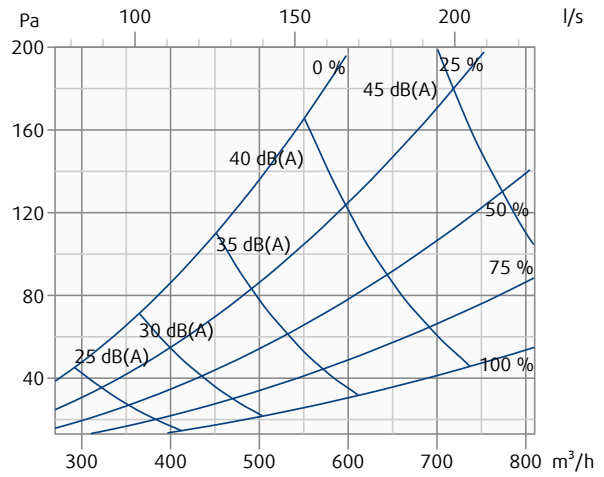
VVKR-A-R-500-24-B-SW + PB-VVK-R-500-200-S-H-D1

Pressure drop & A-weighted sound power level in dB(A)



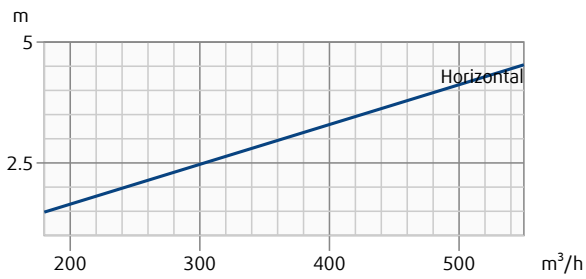
VVKR-A-R-600-24C-B-SW + PB-VVK-R-600-200-S-H-D1

Pressure drop & A-weighted sound power level in dB(A)



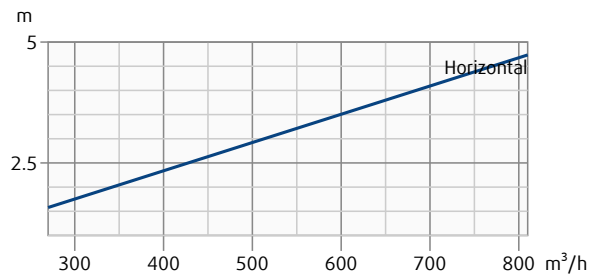
VVKR-A-R-500-24-B-SW + PB-VVK-R-500-200-S-H-D1

Throw length (terminal velocity 0.2 m/s)



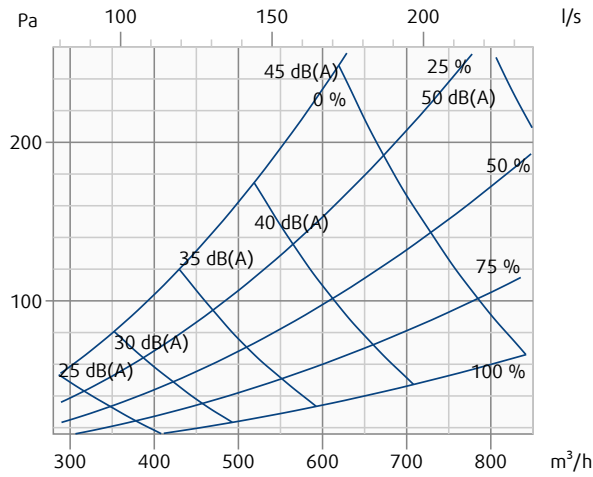
VVKR-A-R-600-24C-B-SW + PB-VVK-R-600-200-S-H-D1

Throw length (terminal velocity 0.2 m/s)



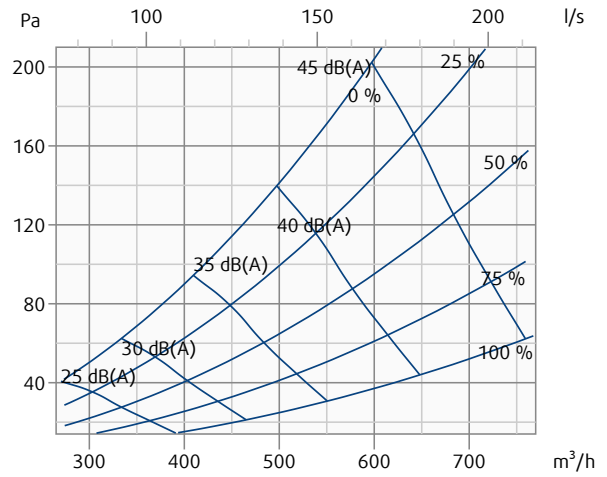
VVKR-A-R-600-32-B-SW + PB-VVK-R-600-200-S-H-D1

Pressure drop & A-weighted sound power level in dB(A)



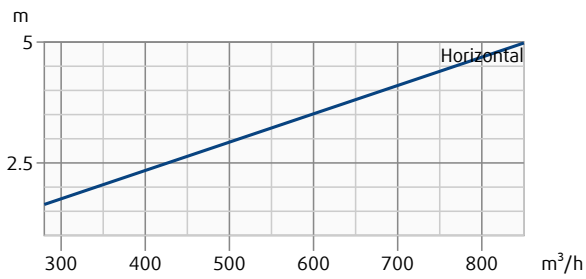
VVKR-A-R-600-32-B-SW + PB-VVK-R-600-250-S-H-D1

Pressure drop & A-weighted sound power level in dB(A)



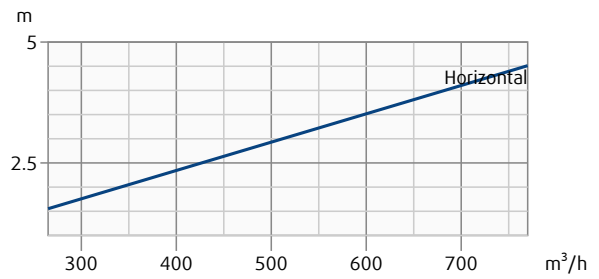
VVKR-A-R-600-32-B-SW + PB-VVK-R-600-200-S-H-D1

Throw length (terminal velocity 0.2 m/s)



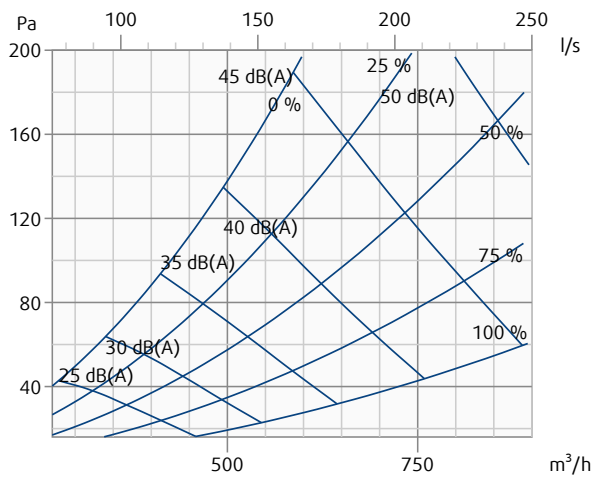
VVKR-A-R-600-32-B-SW + PB-VVK-R-600-250-S-H-D1

Throw length (terminal velocity 0.2 m/s)



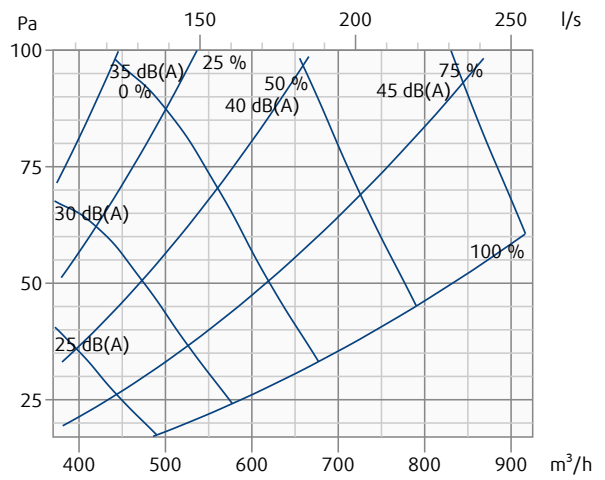
VVKR-A-R-600-40-B-SW + PB-VVK-R-600-200-S-H-D1

Pressure drop & A-weighted sound power level in dB(A)



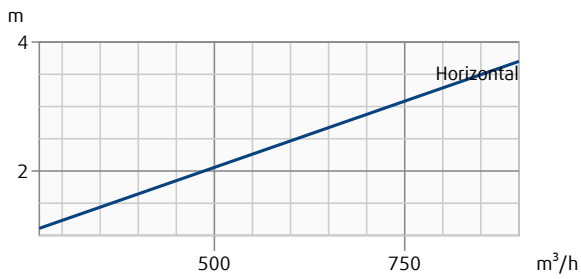
VVKR-A-R-600-48-B-SW + PB-VVK-R-600-200-S-H-D1

Pressure drop & A-weighted sound power level in dB(A)



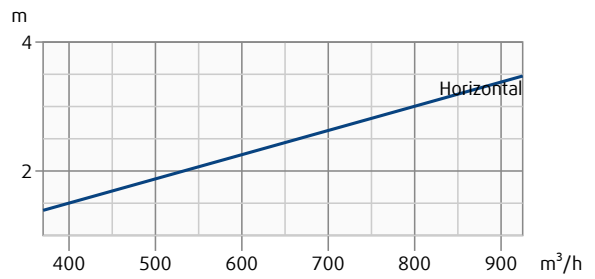
VVKR-A-R-600-40-B-SW + PB-VVK-R-600-200-S-H-D1

Throw length (terminal velocity 0.2 m/s)



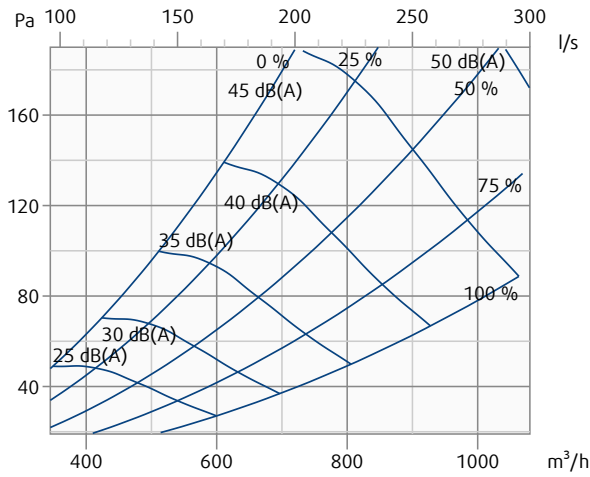
VVKR-A-R-600-48-B-SW + PB-VVK-R-600-200-S-H-D1

Throw length (terminal velocity 0.2 m/s)



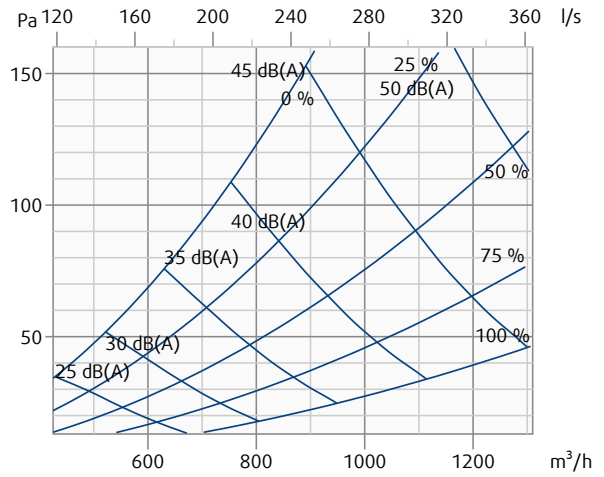
VVKR-A-R-625-54-B-SW + PB-VVK-R-625-200-S-H-D1

Pressure drop & A-weighted sound power level in dB(A)



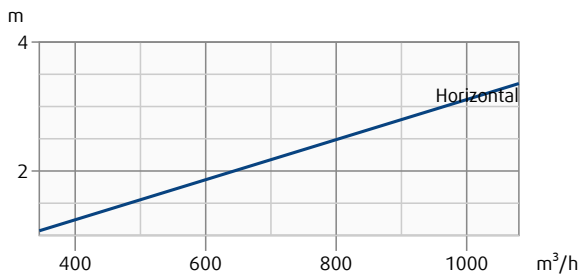
VVKR-A-R-800-72-B-SW + PB-VVK-R-800-315-S-H-D1

Pressure drop & A-weighted sound power level in dB(A)



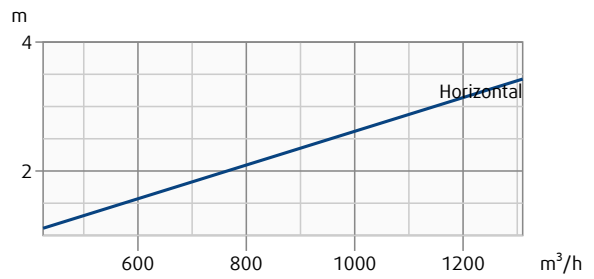
VVKR-A-R-625-54-B-SW + PB-VVK-R-625-200-S-H-D1

Throw length (terminal velocity 0.2 m/s)



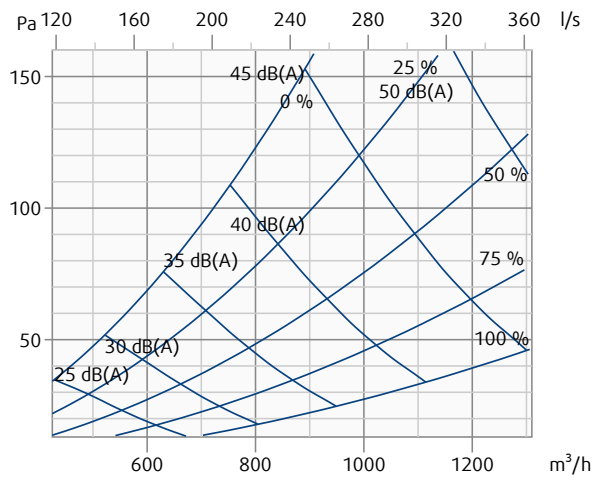
VVKR-A-R-800-72-B-SW + PB-VVK-R-800-315-S-H-D1

Throw length (terminal velocity 0.2 m/s)



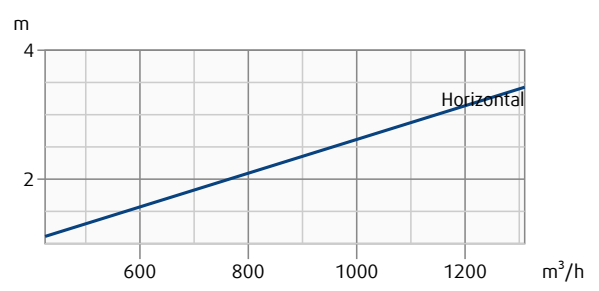
VVKR-A-R-825-80-B-SW + PB-VVK-R-825-315-S-H-D1

Pressure drop & A-weighted sound power level in dB(A)

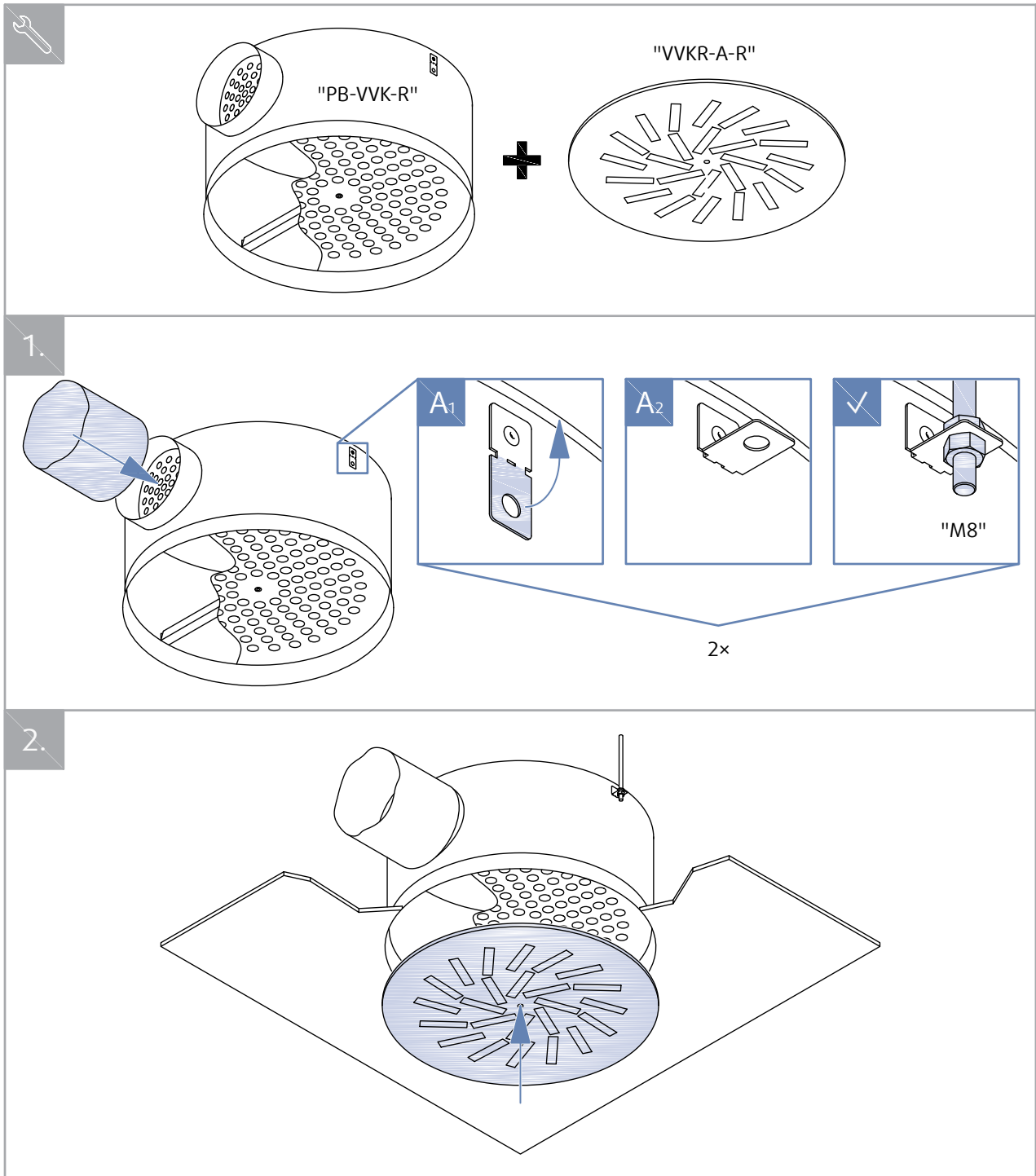


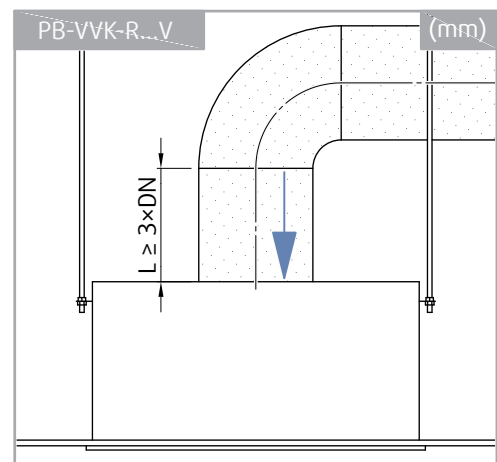
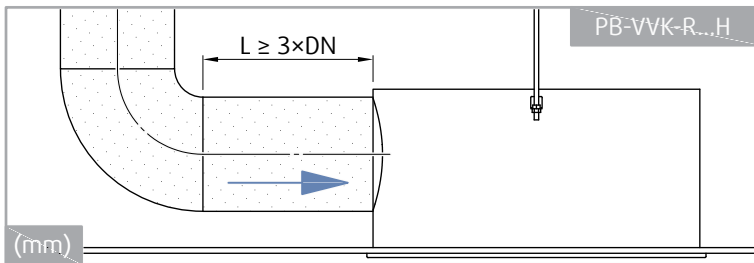
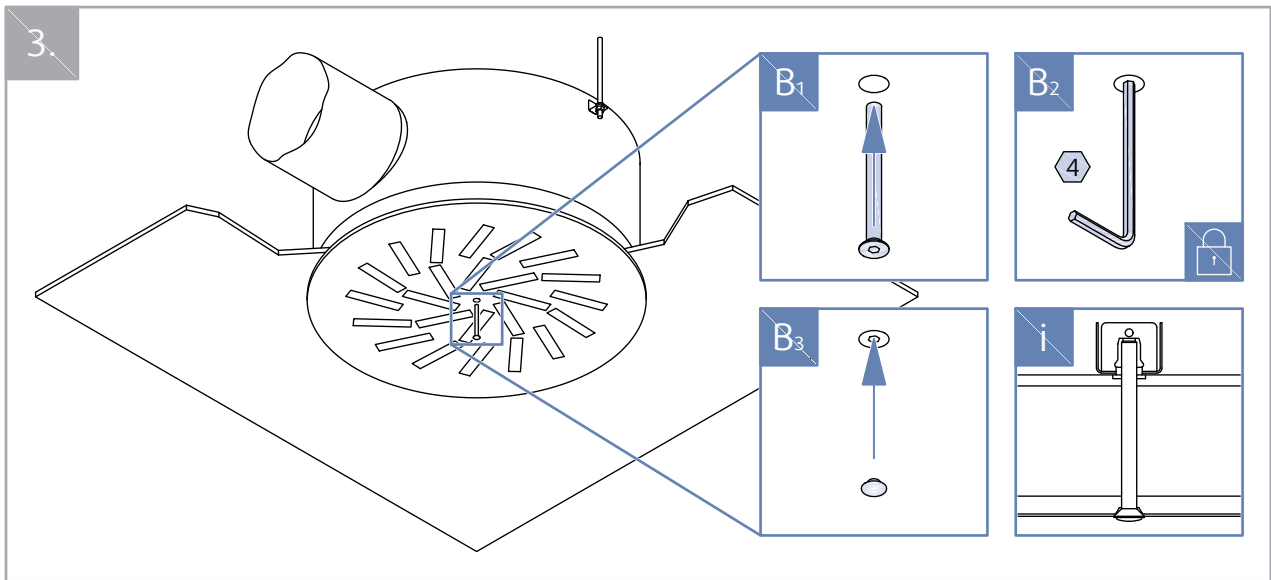
VVKR-A-R-825-80-B-SW + PB-VVK-R-825-315-S-H-D1

Throw length (terminal velocity 0.2 m/s)

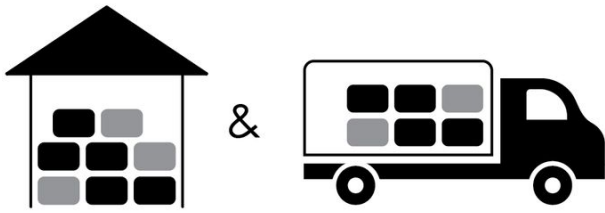



Installation






Transport, Storage and Operation



 °C -40 °C ... +50 °C

 % ≤ 95%



 °C -20 °C ... +50 °C

 % ≤ 95%

Supplement

Any deviations from the technical specifications contained herein and the terms should be discussed with the manufacturer. We reserve the right to make any changes to the product without prior notice, provided that these changes do not affect the quality of the product and the required parameters. Current information on all products is available on design.systemair.com.

