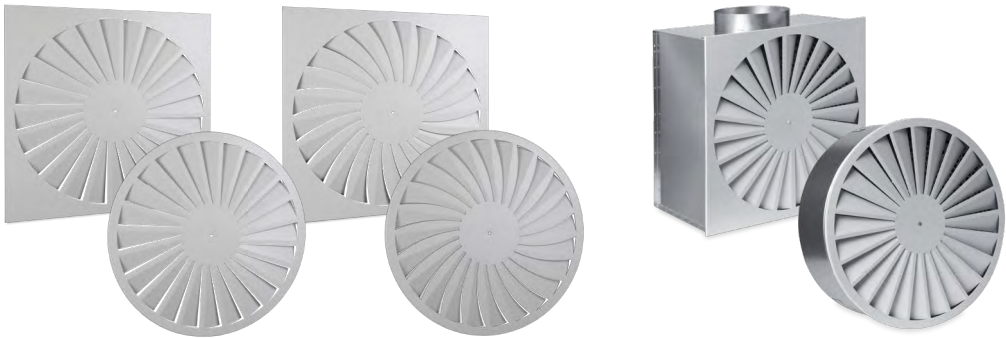




# Swirl Ceiling Diffuser with Fixed Blades



## Ordering Codes

Type	VVKN- A B
Diffuser face circular Diffuser face square	R S
Size	300 400 500 600 625
Surface (and material) finish *	AISI304 AISI316 RALxxxx

### Ordering Code Example:

VVKN-D-S-600-RAL5012                      2 pcs

The product contains of a square box with a type D square diffuser face. The size 600 square diffuser face is powder-painted with a RAL5012 baking enamel.

NOTE: \* If no material or surface finis is defined, the galvanised diffuser will be delivered with RAL9010 gloss 30 powder coating.

## Description

The VVKN swirl diffuser with fixed blades is a comfortable air distribution element. The diffuser face is supplied with a radially aligned set of variously shaped blades, which guarantee an even distribution of swirl supply air into the occupied zone. The VVKN swirl diffuser can be installed onto an air duct using a plenum box with a horizontal or a vertical connection by a flexible circular tube or the SPIRO duct. VVKN can be used for both supply or extract air. The swirl diffuser with fixed blades enables an intensive swirl based on its swirl outlet. It can be used for ventilation, as well as supplying cold or warm air.

### Information about accessories for VVKN is available from page 3.

- PB-VVK - Plenum box
- PB-VVKU - Universal plenum box



Fig. 1: Isothermal air flow visualisation

## Design

### Material used

The diffuser can be manufactured with a circular or a square diffuser face made of galvanized steel. It is also possible to manufacture from stainless steel AISI304 or AISI316. The surface is powder-painted with a white RAL 9010 by default, other RAL types can be applied upon request. In the diffuser's center there is an opening for mounting the diffuser face using a screw. Every VVKN face includes a screw with a decorative white cap for its mounting onto a plenum box as well as a self-adhering seal, which needs to be placed onto the diffuser face during the mounting.

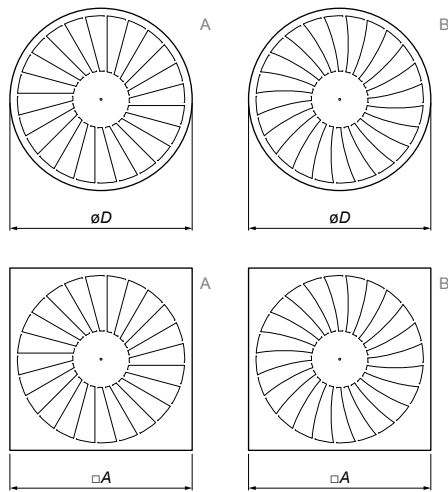


Fig. 2: Diffuser types and shapes

## Dimensions

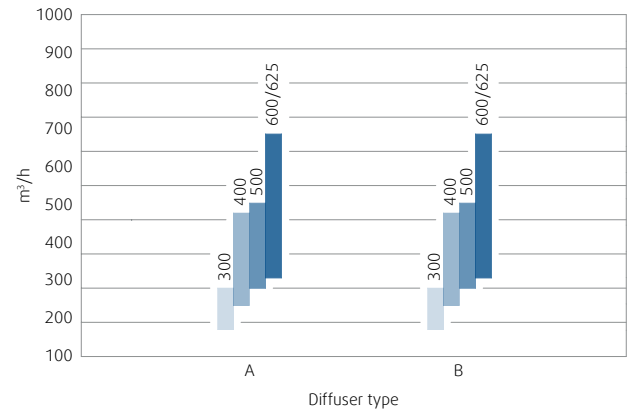
Size	$\varnothing D$	$A$	$m_{\varnothing}$	$m_{\square}$
	(mm)		(kg)	
300	298	296	0,5	0,7
400	398	396	0,9	1,2
500	498	496	1,5	1,9
600	598	596	2,1	2,6
625	623	621	2,3	2,9

Tab. 3: Diffuser dimensions and weight

Size	Type	
	A	B
300	0,010	0,012
400	0,020	0,023
500	0,030	0,035
600	0,050	0,058
625	0,050	0,058

Tab. 2: Free area for diffuser faces  $A_v$  (m<sup>2</sup>)

## Quick Selection



Tab. 1: Table for quick selection

## Technical Details

### Terminology

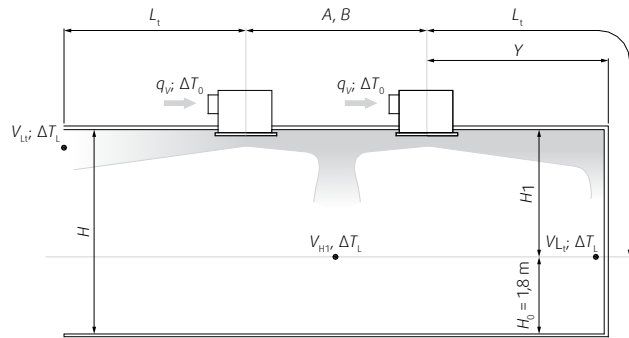


Fig. 3: Air flow inside the room

### Legend

$q_v$	(m <sup>3</sup> ·h <sup>-1</sup> )	- Air flow volume per 1 diffuser
$Y$	(m)	- Horizontal distance to the wall
$H$	(m)	- Room height
$H_1$	(m)	- Distance from the ceiling to the occupied zone
$H_0$	(m)	- Occupied zone
$L_t$	(m)	- Throw distance: by the wall - $L_t = H_1 + Y$ between diffusers - $L_t = H_1 + A/2$
$V_{L_t}, V_{H_1}$	(m·s <sup>-1</sup> )	- Air velocity at throw distance $L_t$ , at distance $H_1$
$\Delta T_0$	(K)	- Temperature difference between the supply and room air
$\Delta T_L$	(K)	- Difference between the airflow core and room air temperature
$A, B$	(m)	- Distance between diffusers by length and by width of the room ( $A$ = distance between columns, $B$ = distance between rows)

## Accessories

### PB-VVK

#### Plenum box



The PB-VVK is produced in 2 types of shapes round (PB-VVK-R) or square (PB-VVK-S), with a horizontal or a vertical connection and with internal or external insulation. 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 (damper information available on page 4)

#### Ordering codes

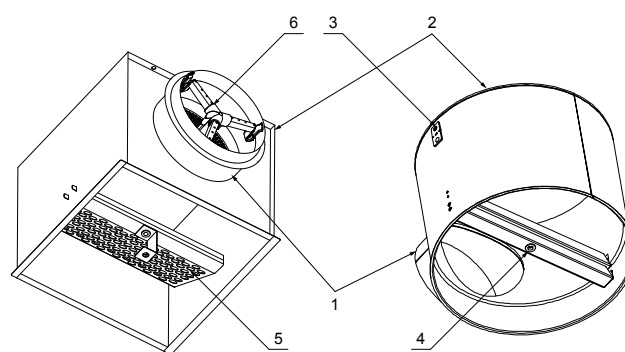
	PB-VVK-
Plenum box face round	R
Plenum box face square	S
Size	300 - 825
Supply with mesh screen	S
Extract without mesh screen	E
Horizontal connection (from the side)	H
Vertical connection (from the top)	V
Untight spigot with a damper <sup>1</sup>	D1
Pressed tight spigot with the Zeus damper <sup>1</sup>	D2
With internal insulation, 14 mm <sup>2</sup>	I2
With external insulation <sup>2</sup>	J

#### Ordering codes example:

PB-VVK - S - 300 - S - H - I2

Square plenum box with size 300, supply with mesh screen, horizontal connection (from the side), spigot type D1, internal insulation.

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. In case the insulation type is not entered in the ordering code, the product PB-VVK will be supplied without insulation.



#### Product parts description:

1. Spigot
2. Casing
3. Hanging bracket
4. Bridge with a rivet nut for connection to a diffuser
5. Mesh screen with a rivet nut for connection
6. Damper

Fig. 4: Product PB-VVK

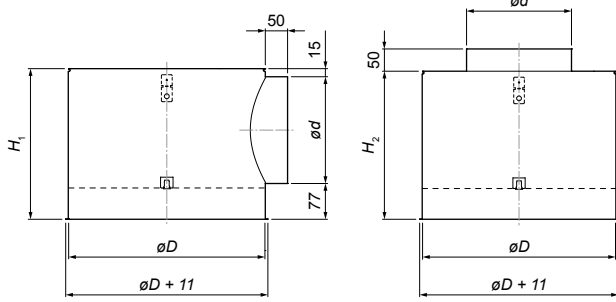


Fig. 5: Main dimensions of the PB-VVK-R

Size	øD	H <sub>1</sub> (horiz.)	H <sub>2</sub> (vert.)	ød	m	
					horiz.	vert.
					(mm)	
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

Tab. 4: Main dimensions of the PB-VVK-R

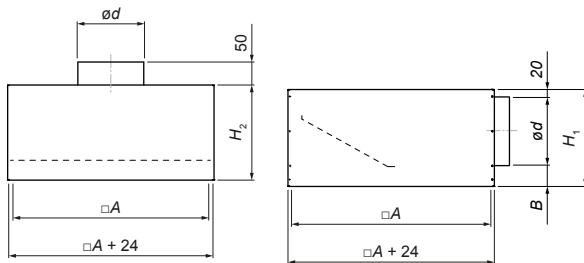
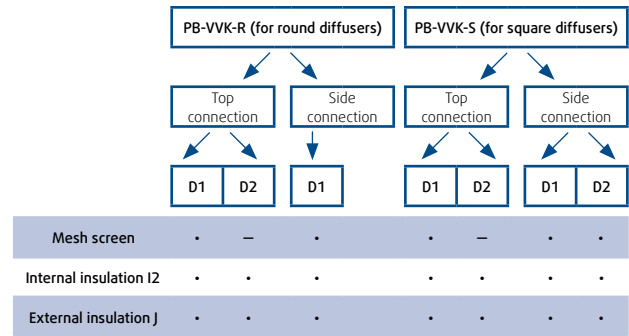


Fig. 6: Main dimensions of PB-VVK-S

Size	A	H <sub>1</sub> (horiz.)	H <sub>2</sub> (vert.)	ød	B	m	
						horiz.	vert.
						(mm)	
300-160	266	240	200	158	62	2,58	2,39
400-160	366	240	200	158		3,62	3,43
400-200	366	280	200	198		3,98	3,65
500-200	466	280	200	198		5,27	4,74
600-200	566	280	300	198		6,71	7,19
600-250	566	330	300	248		7,42	7,31
625-200	591	280	300	198		7,11	7,63
625-250	591	330	300	248	7,81	7,73	
800-315	766	400	300	313	67	13,63	12,03
825-315	791	400	300	313		14,22	12,61

Tab. 10: Main dimensions of the PB-VVK-S

### Plenum box selection diagram

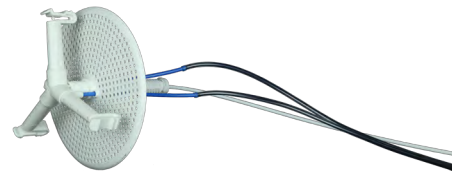


### Legend

D1	- Untight socket with a sheet-metal control damper
D2	- Pressed tight socket with a Zeus damper
xxxx	- Defined selection option
•	- Option to add a position to the selection
–	- Not possible to add a position to the selection

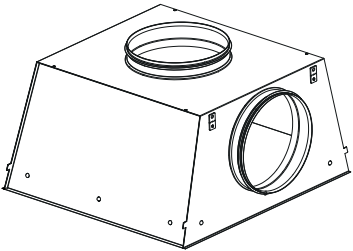
### The Zeus damper

The Zeus control damper contains impulse tubes for measuring differential pressure using a portable measuring device. It can be adjusted manually using a cable gearing.



**NOTE:** In case of using PB-VVK-R with horizontal connection it is not possible to use the Zeus damper.

**PB-VVKU**  
**Universal plenum box**



The PB-VVKU is a universal box which is possible to use for installation on various types of air terminal devices. The PB-VVKU is manufactured from galvanized sheet. Upon customer’s request it is possible to apply a powder-paint RAL surface finish. The box is optimized for use with both horizontal and vertical connection. When in storage, the PB-VVKU provides the advantage of stacking, thus saving storage space.

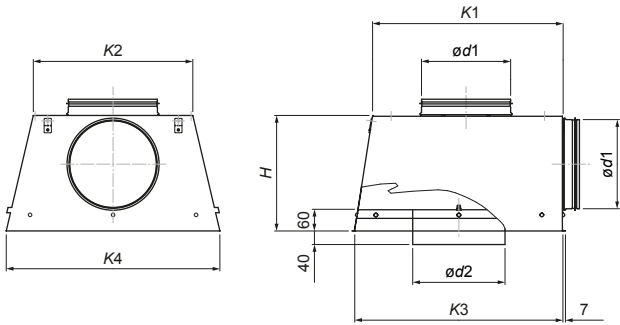
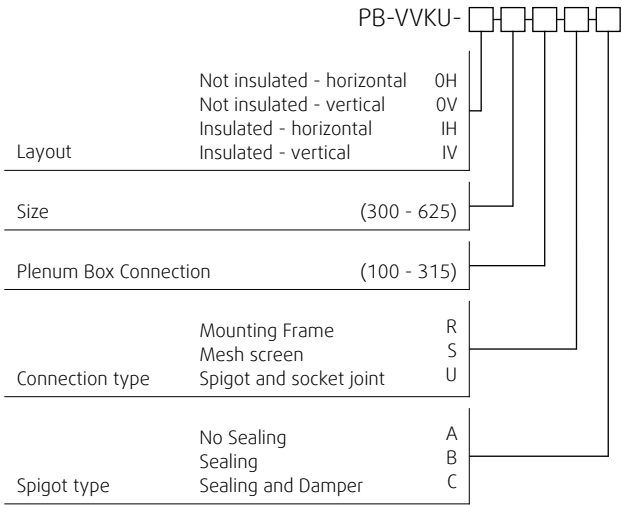


Fig. 7: Main dimensions of the PB-VVKU

**Ordering codes**



Size	ød1	ød2	K1	K2	K3	K4	H	m
	(mm)							(kg)
300	98	126	250	200	278	292	190	1,95
300	123	161	247	200	278	292	215	2,20
300	158		242	185	278	292	250	2,50
400	158	202	340	279	378	392	240	4,10
400	198	252	334	260	378	392	280	4,50
500	158		438	375	478	492	250	5,90
500	198	317	432	356	478	492	290	6,10
500	248		432	336	478	492	320	6,50
600	198	317	535	465	578	592	270	6,70
600	248		528	442	578	592	320	7,70
600	313	402	500	400	578	592	385	8,90
625	198		560	490	603	617	270	8,70
625	248	402	553	467	603	617	320	9,10
625	313		540	440	603	617	385	9,70

Tab. 6: Main dimensions and weight of the PB-VVKU

**Ordering codes example:**

PB-VVKU - OH - 300 - 100 - S - B

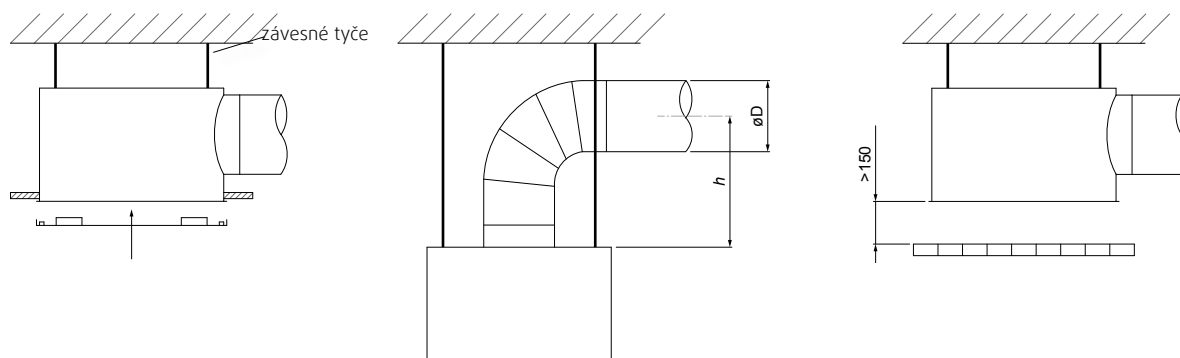
Universal plenum box, not insulated with horizontal supply, size 300, connection dimension 100, mesh screen, sealed socket.

NOTE: When using the PB-VVKU plenum box, it is recommended to read the technical documentation for the product TPI-07.

## Mounting

The VVKN swirl diffuser is most commonly installed onto a ventilation duct as illustrated on Fig. 8. The mounting consists of installing the plenum box to the ceiling using draw-bars and mounting the diffuser face onto the plenum box using a centric screw which is included in the delivery.

Fig. 8 depicts various methods of installing the VVKN onto the ceiling. When mounted into a suspended grid ceiling the supply air swirl is expected to be partially reduced. It is therefore needed to respect the minimum distance of the diffuser - at least 150 mm from the grid ceiling.



1. Flush mounted for continuous suspended ceiling

2. Free hanging installation onto ceiling  
 $h_{\min} > (3 \sim 5) D$

3. Installation between the ceiling and the suspended grid ceiling

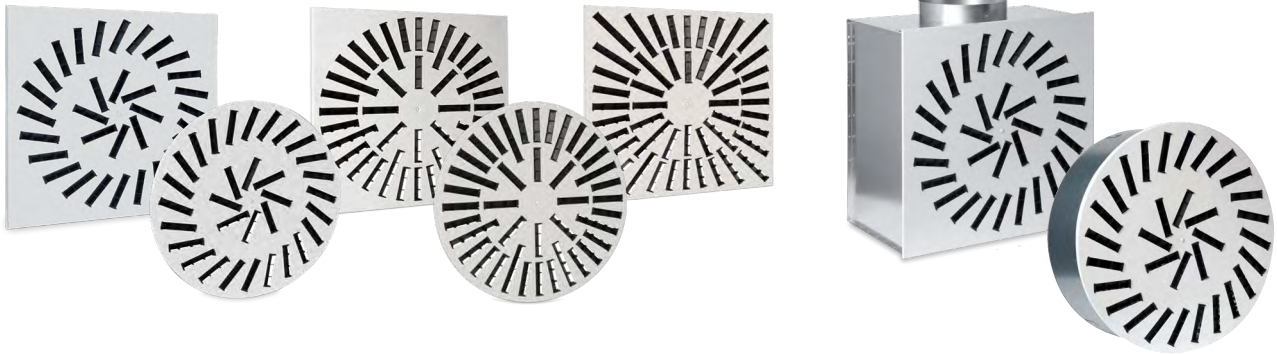
Fig. 8: Examples of mounting

## Diffusers – Related Products

### VVKR

#### Swirl Ceiling Diffuser with Adjustable Blades

Product information is available on [design.systemair.com](https://design.systemair.com)



### VVT

#### Swirl Ceiling Diffuser with Thermostatic Control

Product information is available on [design.systemair.com](https://design.systemair.com)

