

# VZ-41

Linear slot diffuser for ceiling and wall installation – 41 mm



## BRIEF INFORMATION

- Available as standard module or wall-to-wall variant
- Module length: 1000 mm, 1500 mm, 2000 mm
- Standard colour white RAL 9003
- As one, two, three or four slot variant (more slots on request)
- Multi-variably adjustable:
  - Plane distribution pattern as well as the possibility to adjust the distribution pattern in a range of 180°
- Lightweight extruded aluminium profile
  - Naturally anodised or coated (RAL or NCS)
- Mitered corner modules available
- Air deflectors made of impact-resistant plastic
  - 5 standard colours
- Further Options:
  - Support profiles
  - End bracket, left and/or right
  - Endplate
  - Perforated plate throttle in the socket
  - Galvanized steel Junction box (optionally insulated)

VZ-41 vertical jet								
Number of slots (n)	L <sub>WA</sub> = 25 dB		L <sub>WA</sub> = 30 dB		L <sub>WA</sub> = 35 dB		L <sub>WA</sub> = 40 dB	
	V l/s	V (m <sup>3</sup> /h)	V l/s	V (m <sup>3</sup> /h)	V l/s	V (m <sup>3</sup> /h)	V l/s	V (m <sup>3</sup> /h)
1	26	92	30	109	36	129	42	152
2	35	127	43	154	52	186	62	224
3	46	166	55	199	66	238	79	285
4	54	196	66	237	79	286	96	346

VZ-41 horizontal air jet								
Number of slots (n)	L <sub>WA</sub> = 25 dB		L <sub>WA</sub> = 30 dB		L <sub>WA</sub> = 35 dB		L <sub>WA</sub> = 40 dB	
	V l/s	V (m <sup>3</sup> /h)	V l/s	V (m <sup>3</sup> /h)	V l/s	V (m <sup>3</sup> /h)	V l/s	V (m <sup>3</sup> /h)
1	24	88	29	105	34	124	41	147
2	38	137	45	163	54	195	65	233
3	47	168	56	201	67	242	81	290
4	57	206	69	248	83	298	99	358

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# Technical description

## Design

The linear slot diffuser VZ-41 with a system width of 41 mm is intended in particular for wall and ceiling installation. The diffuser can be manufactured in single or multi-slot design and mounted in band arrangement.

The diffuser consists of extruded aluminium profiles, optionally with or without lateral support, and the pivoting, individually adjustable air deflectors with rectifier blades and double boomerang profiles.

The VZ-41 can be used for supply and extract air (also as a combined supply / extract air diffuser with parallel slotted rails) and is particularly suitable for constant and variable air flow systems in rooms with ceiling heights from 2.30 m to 4.00 m. The recommended air flow range is between 50 m<sup>3</sup>/h lm and 150 m<sup>3</sup>/h lm at temperature differences of +4 K to -12 K.



## Function

The VZ-41 is equipped with 75 mm long, individually adjustable air deflectors. This allows the adjustment of a plane air jet as well as the adjustment of many individual air jets in a range of 180°. In particular, generated individual air jets lead to rapid velocity and temperature difference reduction with diffuse settings.

## Material and surface treatment

- Extruded aluminium profiles, natural anodised or coated (RAL or NCS).
- Air deflectors made of impact-resistant plastic, similar:
  - RAL 9005, black.
  - RAL 9010, white.
  - RAL 9003, signal white.
  - RAL 9006, white aluminium.
  - RAL 7035, light grey.
- Commissioning box made of steel galvanised material.

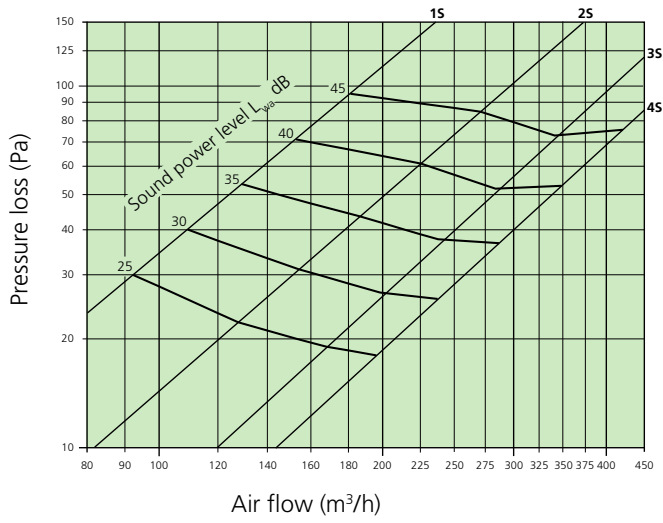
## Accessories

- Support profiles.
- End angle, left and/or right.
- End plate.
- Commissioning box (optionally insulated).
- Perforated plate air regulator in the sleeve coupling.

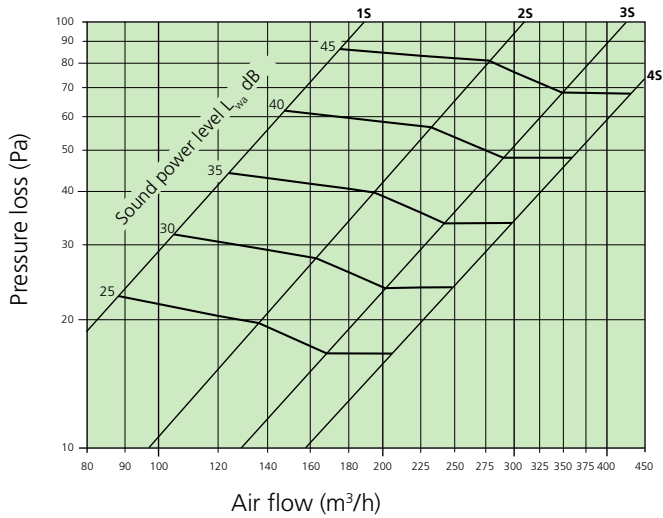
# Technical data

## Engineering graphs

### Vertical air jet



### Horizontal air jet

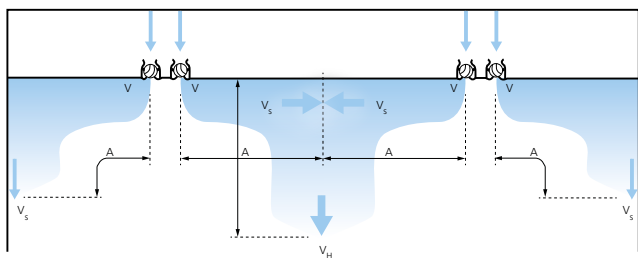


## Determination of local velocities with tangential air jet guidance

The following two drawings and diagrams are valid for a tangential air jet guidance, i.e., the supply air is distributed close to the ceiling.

The engineering graphs can be used to determine the air jet velocities  $v_s$  of the supply air jet at a certain distance (up to the point of impact) from the slot diffuser and, after the point of impact, the vertical velocity  $v_H$  in the occupied area.

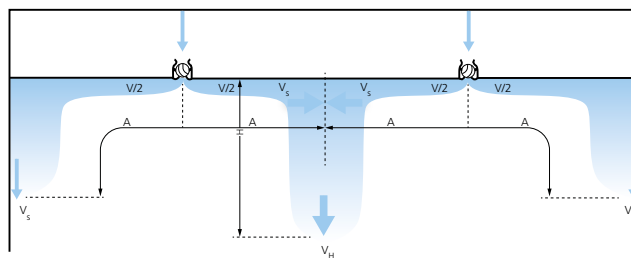
### One-sided air jet guidance



The one-sided air jet guidance for slot diffusers describes the redirection of the total air flow of a diffuser, one-sided (left or right) along the ceiling. (Roller position 1 ceiling jet).

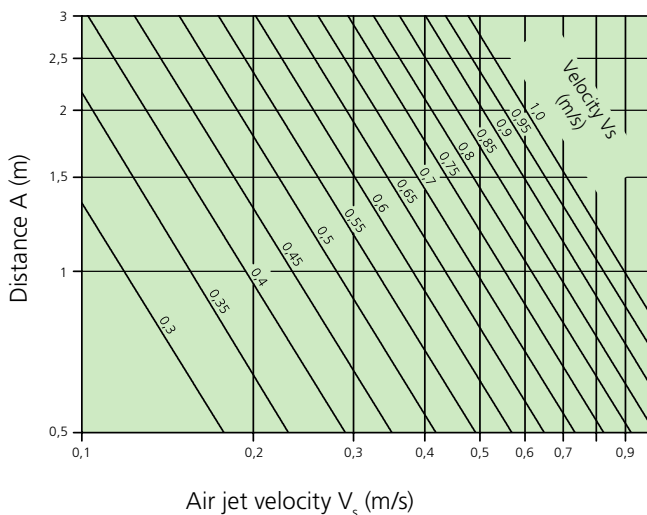
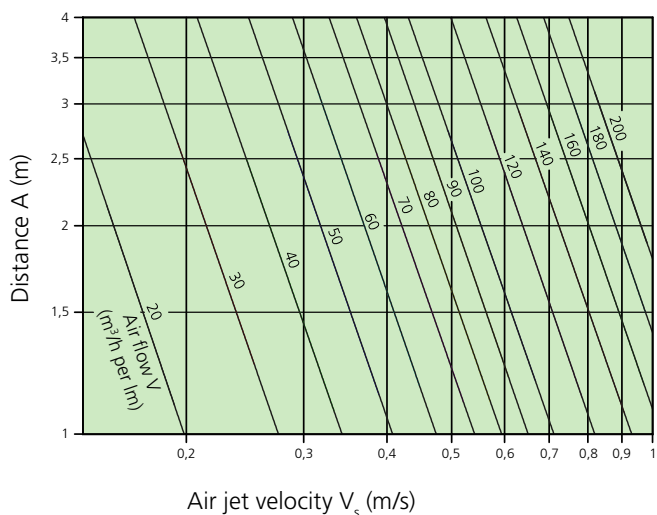
The slot diffusers can be mounted directly next to each other or, for example, on both sides of a luminaire. The distance between the two adjacent slot diffusers is irrelevant, the essential factors are the run lengths A and H of the air jet (wall jet and centre air jet)

### Diffuse air jet guidance



Slot diffusers with roller position 1, (alternating left / right) are used for air jet guidance on both sides. In this case, only half the specific air flow  $V/2$  ( $m^3/h$  lm) may be used to determine the air jet velocity  $v_s$ .

## Determination of the air jet velocities $v_s$ and $v_H$



The air jet velocity  $v_s$  (m/s) is determined at a distance A from the air outlet (length of the air jet along a wall or ceiling) as a function of the specific slot load (air flow per meter of slot).

Attention: In the case of diffuse air jet guidance, only half the specific air flow is to be applied.

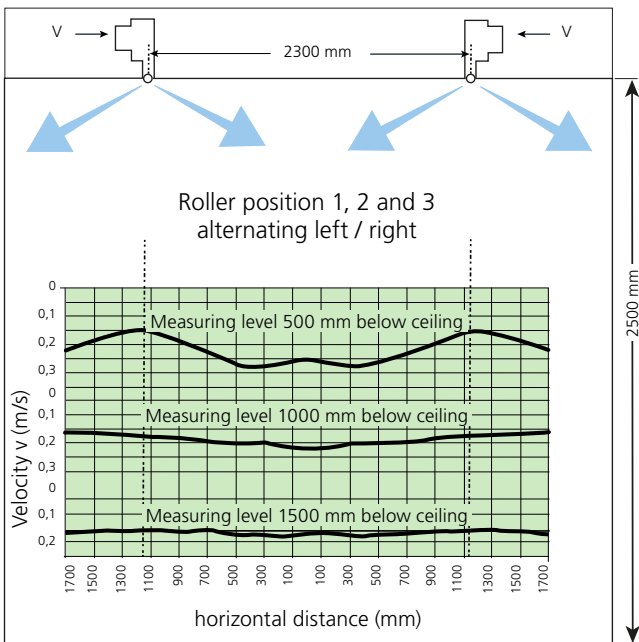
The vertical velocity  $v_H$  (m/s) is determined as a function of the ceiling distance  $H$  (m) and the previously determined velocity  $v_s$  at the point of impact.

### Installation example 1

For low room heights (between 2.4 m and about 3.0 m), comparatively high cooling loads can still be covered while ensuring the comfort criteria if a diffuse roller setting is selected. For this purpose, the rollers (viewed in the longitudinal direction) must be set to distribute alternately to the "right" or "left". The jet axes of the individual air jets are directed into the room at an angle of approx. 30° (measured from the ceiling).

The average velocities recorded at three levels below the outlets clearly show that thermal comfort is ensured despite high air exchange rates (approx. 17 h<sup>-1</sup>) and cooling loads (approx. 110 W/m<sup>2</sup>).

Air flow V = 100 m<sup>3</sup>/h lm, temperature difference ΔT = -8 K

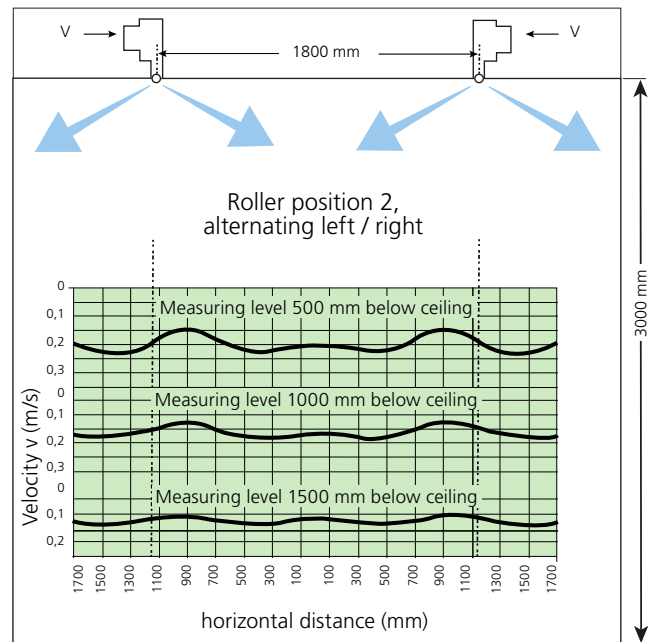


### Installation example 2

For room heights of approx. 3.0 m and higher, a diffuse roller setting can also be selected with a minimum distance of 1800 mm (alternately blowing out to the "right" or "left"). However, at these room heights, the jet axes of the individual air jets must be directed into the room at an angle of approx. 45° (measured from the ceiling) in order to transport the fresh air into the occupied area as well.

The average velocities recorded at three levels below the outlets also show in this example that thermal comfort is ensured at high air exchange rates (about 15 h<sup>-1</sup>) and cooling loads (about 110 W/m<sup>2</sup>).

Air flow V = 80 m<sup>3</sup>/h lm, temperature difference ΔT = -8 K

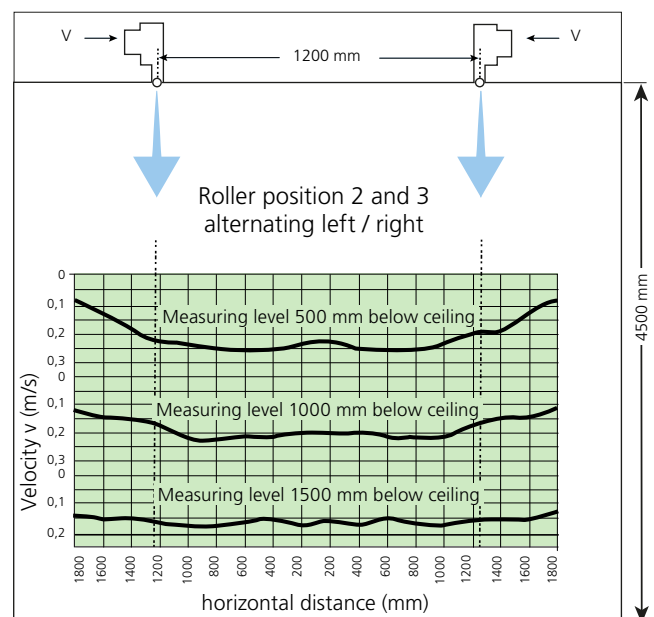


### Installation example 3

The greater the room heights become, the steeper the air jets must be directed downward. In addition, the slot rows can be arranged at a smaller distance from each other.

The following example shows the average velocities measured at three room levels at a room height of 4.50 m. This example also shows that draft-free ventilation is ensured.

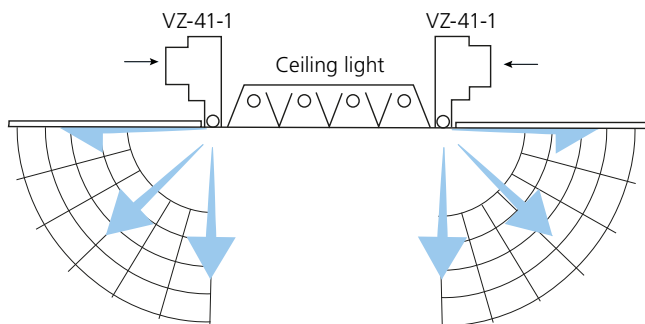
Air flow V = 80 m<sup>3</sup>/h lm, temperature difference ΔT = -8 K



## Installation example

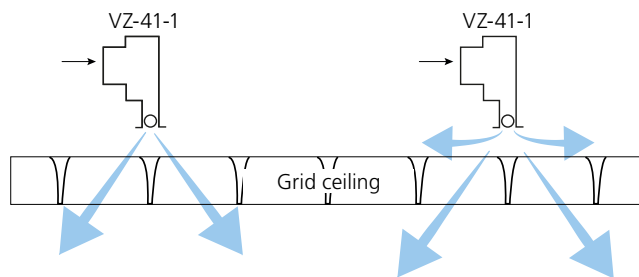
### Combination slot diffuser with ceiling light

One slot diffuser VZ-41-1 each mounted on both sides of a ceiling light (distribution fanned out).



### Supply air guidance via grid ceiling

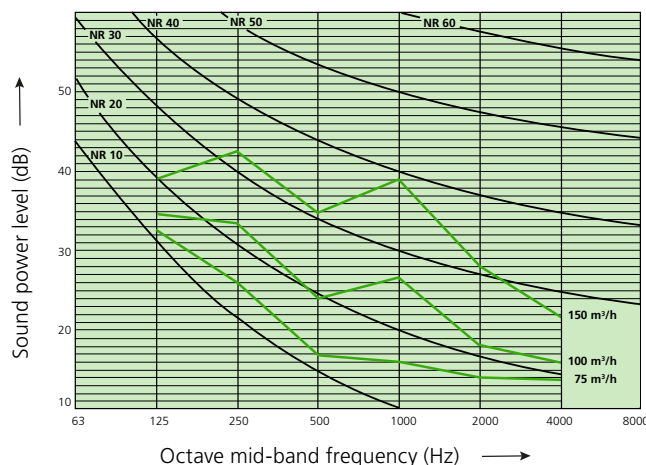
- 1.) Distribution 60°, both sides
- 2.) Distribution 60°, both sides with horizontal part



## NR - Limit curves

Two different noises with formally the same A-weighted sound power level can be perceived as differently disturbing. For this reason, the sound power levels are evaluated for their frequency-dependent distribution according to the NR limit curves in the octave bands.

The diagram below shows the sound power levels in the different octave bands for three different air flows (75, 100 and 150 m<sup>3</sup>/h), measured on a VZ-41-1 with a length of 1250 mm and a connection nozzle diameter of 99 mm. (The data refer to roller position 2, alternately distributing out right / left. A slight increase in sound power levels occurs at roller position 1, and a slight decrease at roller positions 3 and 5. However, the range of variation is within the measurement tolerances, so it does not have to be taken into account in the project planning.)

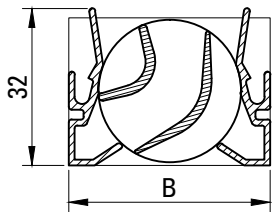


# Dimensions

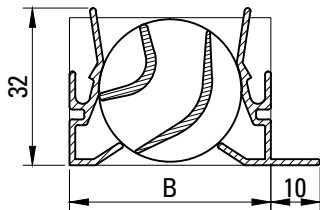
Number of slot rows n	Commissioning box variant	ø d (mm)	C (mm)	H (mm)	h (mm)	B1 (mm)	B (mm)
1	A	98	116	190	120	135	41
	B	123	116	215	145	160	
2	A	123	156	215	145	160	81
	B	138	156	230	160	175	
3	A	138	196	230	160	179	121
	B	158	196	250	180	195	
4	A	158	236	250	180	239	161
	B	198	236	290	220	239	

The dimensions given are external dimensions (mm) and can be varied within functional limits according to requirements.  
 Nozzle length 50 mm.

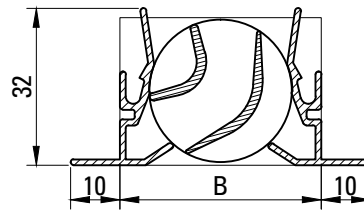
### Profile rail without support



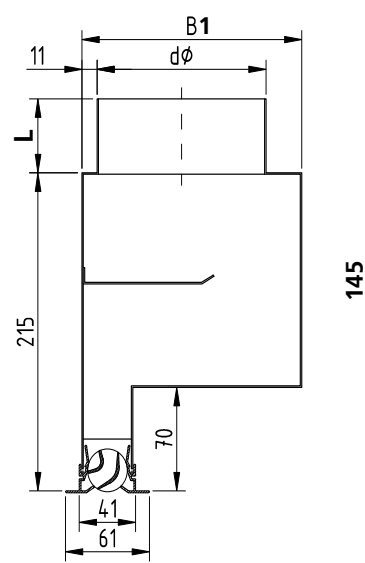
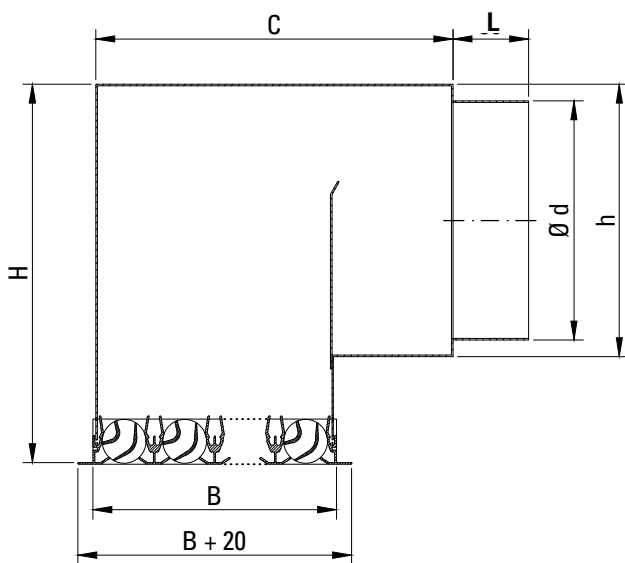
### Variant AP1: with one-sided support



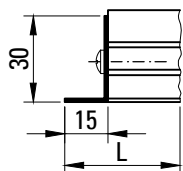
### Variant AP2: with support on both sides



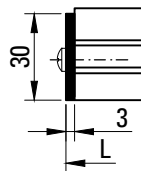
### Slot diffuser with commissioning box AK



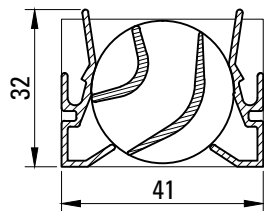
**Profile rails with end angle (EW)**



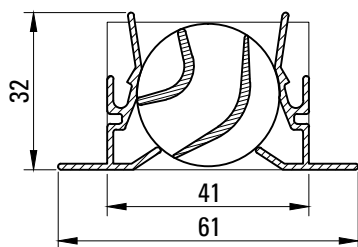
**Profile rails with end plate (EP)**



**One-slot diffuser VZ-41-1**

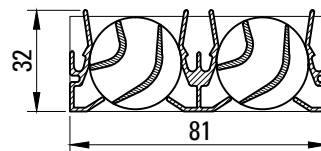


*without support*

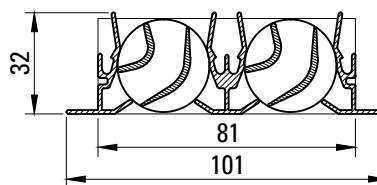


*with support*

**Two-slot diffuser VZ-41-2**

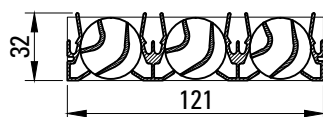


*without support*

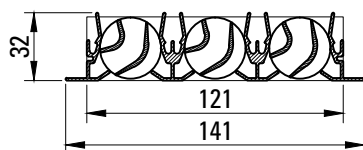


*with support*

**Three-slot diffuser VZ-41-3**



*without support*

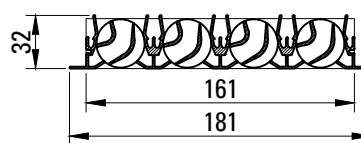


*with support*

**Four-slot diffuser VZ-41-4**

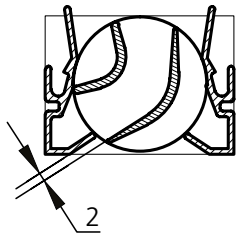


*without support*

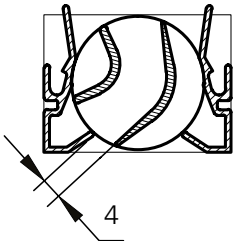


*with support*

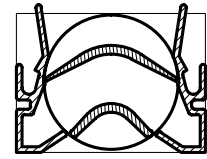
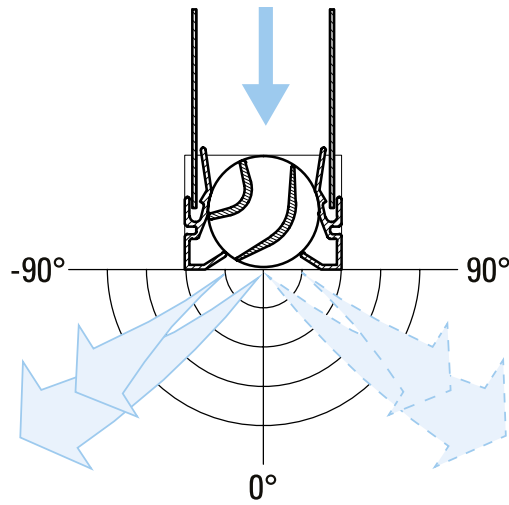
## Adjustable air jet directions



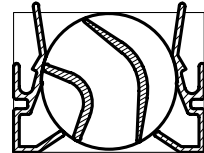
Position 1:  
one-sided or double-sided  
ceiling contact



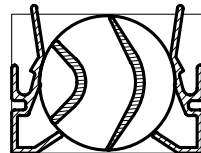
Position 2:  
One-sided or double-sided 30°  
and 45° individual air jets



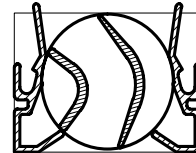
Position 6:  
closed



Position 5:  
vertical

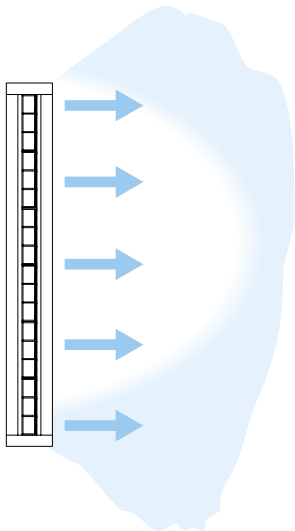


Position 3:  
vertical, expansion 45°

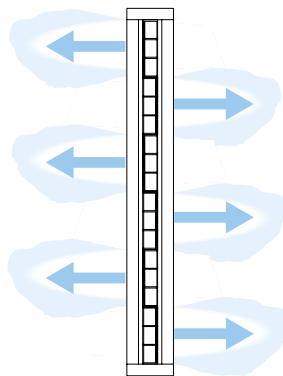


Position 4:  
vertical, expansion 35°

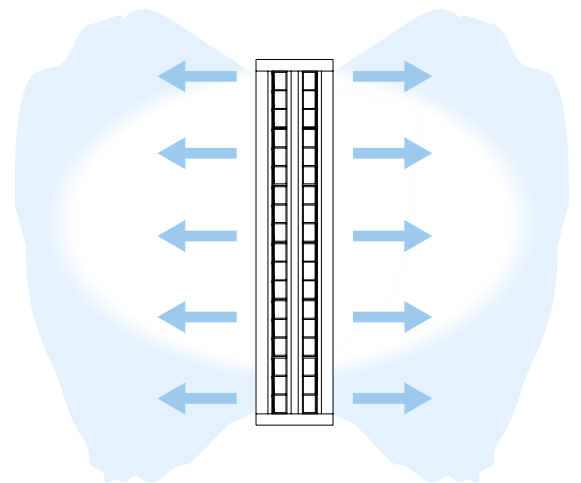
## Air jet formations



one-sided



diffuse



two-sided

# Specification

## Product

Type	VZ-41	1	AP2	AK	1000	EWB
Number of slot rows						
with support profile on both sides						
with commissioning box						
length, external dimension						
with end angle on both sides						

## Accessories

AP2	with support profile on both sides (AP1: with support profile on one side)
EP	End plate to cover the front of the aluminium slot diffuser. (EPL = end plate left, EPR = end plate right, EPB = end plate on both sides).
AK/H	Galvanised steel commissioning box with horizontal nozzle
AK/V	Galvanised steel commissioning box with vertical nozzle
ISO	Internal insulation of the commissioning box
D	Perforated plate air regulator in the outlet of the commissioning box made of steel, galvanised; operation by band tension
TRA/CL	TRA= crossbar attachment, CL = clip attachment
EW	End angle to cover the front of the aluminium slot diffuser. (EWL = end angle left, EWR = end angle right, EWB = end angle on both sides).

# Specification text

SLT linear diffuser with a system width of 41 mm, intended in particular for wall and ceiling installation with the following functions:

- Extruded aluminium profiles, natural anodised or coated (RAL or NCS).
- Rotatable air deflectors with rectifier blades and double boomerang profiles for individual air jet deflection in a swivel range of 180°.
- Air deflectors made of impact-resistant polystyrene, black or white as standard, other RAL colours on request.