

VZ-15

Linear slot diffuser for ceiling or wall - system width 15 mm



QUICK FACTS

- Discreet design for an almost invisible installation
- Can be installed as a single module or in continuous lengths
- 1, 2, 3 or 4 slots (more slots upon request)
- Suitable for rooms with ceiling heights of 2.7–4.0 m
- High flexibility with the adjustable air deflectors
- Available with support profiles and end angles
- Plenum box with a horizontal or vertical duct connection
- Standard colour white RAL 9003
- Air deflectors in standard colour Jet Black RAL 9005

Number of slots	Vertical							
	$L_{WA} = 25 \text{ dB}$		$L_{WA} = 30 \text{ dB}$		$L_{WA} = 35 \text{ dB}$		$L_{WA} = 40 \text{ dB}$	
	V l/s	V (m ³ /h)	V l/s	V (m ³ /h)	V l/s	V (m ³ /h)	V l/s	V (m ³ /h)
1	62	25	74	36	89	50	107	70
2	95	21	115	30	140	43	169	60
3	124	18	152	25	185	35	226	50
4	153	18	187	26	229	37	281	53

The specified A-weighted sound power levels and pressure losses are valid for connection box variant B with $L = 1 \text{ m}$.

Number of slots	Horizontal							
	$L_{WA} = 25 \text{ dB}$		$L_{WA} = 30 \text{ dB}$		$L_{WA} = 35 \text{ dB}$		$L_{WA} = 40 \text{ dB}$	
	V l/s	V (m ³ /h)	V l/s	V (m ³ /h)	V l/s	V (m ³ /h)	V l/s	V (m ³ /h)
1	51	18	61	26	75	38	90	53
2	75	13	93	19	114	28	140	40
3	98	12	122	17	151	25	188	37
4	119	10	150	16	188	24	236	36

The specified A-weighted sound power levels and pressure losses are valid for connection box variant B with $L = 1 \text{ m}$.

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Technical description

Design

VZ-15 is a linear slot diffuser with a profile width of only 15 mm, intended for wall or ceiling installation. The slot diffuser is designed in particular for almost invisible installation in ceilings, walls or shadow gaps.

The diffuser is available with 1 to 4 slots, and can be installed as single module or in a continuous linear arrangement, with active and passive diffusers without breaking the aesthetic uniformity. End angles allow for versatile use of the slot diffuser, these can either be mounted on the right, left or both sides of the diffuser.

The diffuser is available with or without support profiles. The slot front rail is fitted with 100 mm long air deflectors, each individually adjustable.

Functionality

VZ-15 is intended for supply or extract air and is suitable for constant or variable air flow systems.

Individually adjustable air deflectors on the slot diffuser allow for easy adjustment of the distribution pattern. The formation of individual air discharge during a diffuse distribution pattern results in a rapid reduction of air velocity and temperature difference, while the pressure loss and sound power level are minimally influenced by the position of the air deflectors.

Material and surface treatment

Slot diffuser

- Made of extruded aluminium.
- Standard colour:
 - RAL 9003, signal white, gloss 70
- Alternative standard colours:
 - RAL 9010, pure white, gloss 70
 - RAL 9006, white aluminium, gloss 70
 - RAL 9005, jet black, gloss 70
 - RAL 7035, light grey, gloss 70

End angles

- Made of aluminium.
- Painted in the same colour as the slot diffuser.

Air deflectors

- Made of impact-resistant plastic.
- Standard colour (similar to):
 - RAL 9005, jet black
- Alternative standard colours (similar to):
 - RAL 9003, signal white

Adaptation

- Other lengths or slots available on request.
- Other colours available on request.



Accessories

Plenum box

Plenum box for slot diffusers with a profile width of 15 mm.

- Horizontal or vertical duct connection.
- Perforated commissioning damper in the spigot, actuated by pull cable. Can be supplied without the damper on request.
- Rubber seal.
- Made of galvanised steel.
- Available non-insulated or with sound-absorbing insulation, B-s1, d0 in accordance with EN ISO 11925-2

Planning

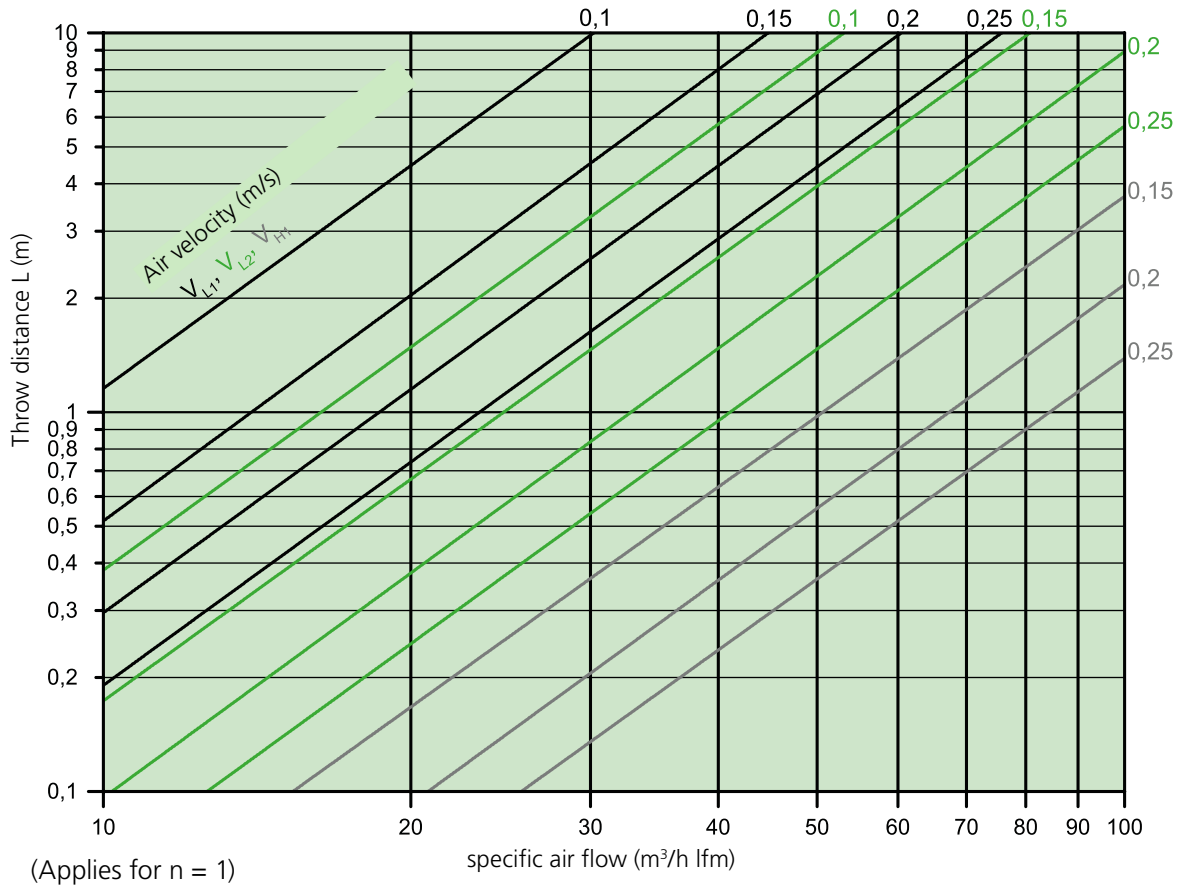
The slot diffuser is available in the lengths 1000, 1500 and 2000 mm as standard.

VZ-15 is suitable in rooms with ceiling heights from 2.7 m to 4.0 m with temperature differences between +10 K and -12 K.

VZ-15 can be installed as a single module or in a continuous linear arrangement, with a combination of active and passive diffusers. The active slot diffusers are connected to the duct system using the plenum box.

Technical data

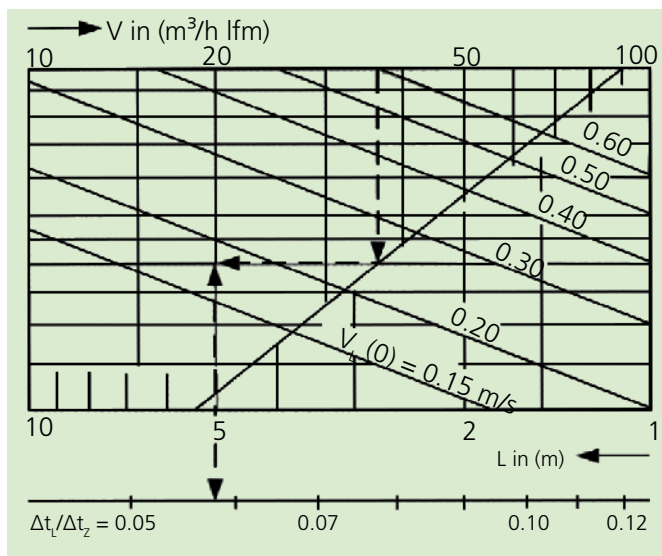
Sizing diagram



Single-sided ceiling air discharge

(air velocity $v_L(0)$ and temperature quotient $\Delta t_L/\Delta t_z$)

Example: single-sided ceiling air discharge
 $V = 36 \text{ m}^3/\text{h lfm}$, $B = 1.0 \text{ m}$, $L = 5.0 \text{ m}$, $\Delta t_z = -8.5 \text{ K}$



Determining the air velocity v_L :

Diagram 1 shows $v_L(0) = 0.18 \text{ m/s}$ and $\Delta t_L/\Delta t_z = 0.058 = |\Delta t_L| = (-8.5) \times 0.058 = 0.5 \text{ K}$

Table (K_1) shows $K_1 = 0.06 \text{ m/s}$

The air velocity is calculated as follows:

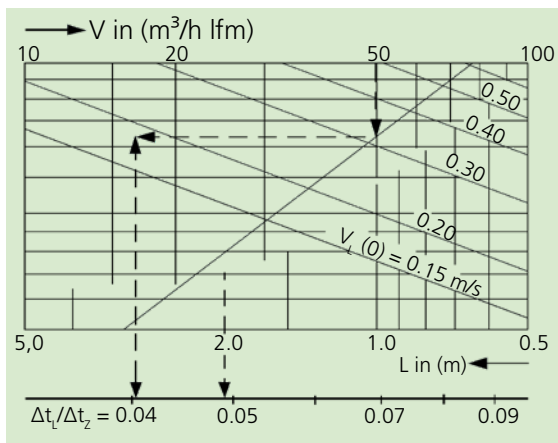
$$v_L = v_L(0) + K_1 = 0.18 + 0.06 = 0.24 \text{ m/s}$$

Correction factor K_1 (Table 1):

$B \text{ (m)}/\Delta t_L \text{ (K)}$	0.1	0.2	0.5	1.0
0.5	0.00	0.01	0.03	0.06
1.0	0.01	0.03	0.06	0.11
1.5	0.02	0.04	0.09	0.16
2.0	0.03	0.05	0.12	0.20

Alternating ceiling air discharge

(air velocity $v_L(0)$ and temperature quotient $\Delta t_L/\Delta t_z$)



Example: Diffuse ceiling air discharge

$V = 50 \text{ m}^3/\text{h lfm}$, $B = H_1 = 1.0 \text{ m}$, $L = 3.0 \text{ m}$, $A = 2 \text{ m}$, $\Delta t_z = -5 \text{ K}$

Determining the air velocity v_L :

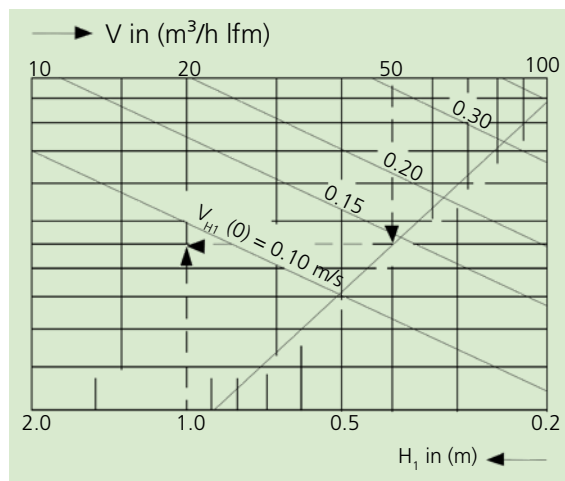
Diagram 2 shows $v_L(0) = 0.18 \text{ m/s}$ and $\Delta t_L/\Delta t_z = 0.04 = |\Delta t_L| = (-5) \times 0.04 = 0.2 \text{ K}$,

Table(K_1) shows $K_1 = 0.03 \text{ m/s}$

The air velocity is calculated as follows:

$$v_L = v_L(0) + K_1 = 0.18 + 0.03 = 0.21 \text{ m/s}$$

Air velocity v_{H1}



Determining the air velocity v_{H1} :

Diagram 3 shows $v_{H1}(0) = 0.09 \text{ m/s}$ and Diagram 2 shows ($L = A/2 + H_1 = 2.0 \text{ m}$):

$$\Delta t_L/\Delta t_z = 0.05 = |\Delta t_L| = (-5) \times 0.05 = 0.25 \text{ K}$$

Interpolation in Table (K_1) results in $K_1 = 0.04 \text{ m/s}$.

The air flow speed is calculated as follows:

$$v_{H1} = v_{H1}(0) + K_1 = 0.09 + 0.04 = 0.13 \text{ m/s}$$

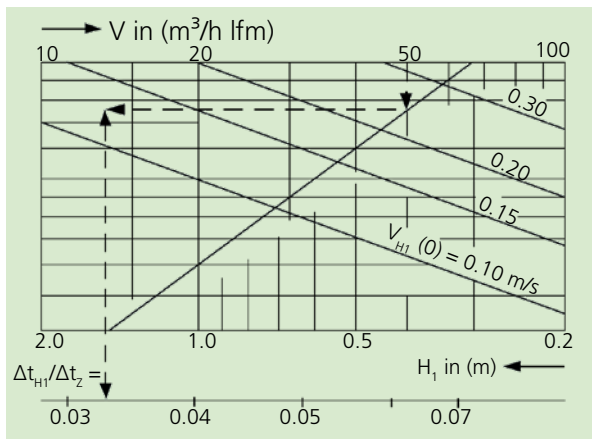
Note:

the distance between two outlets should be at least 1.5 m ($A = 1.5 \text{ m}$).

For $2\text{m} < A < 4\text{m}$, $v_{H1}(0)$ increases by up to 25% compared to the diagram.

Alternating ceiling air discharge without Coanda effect

(air velocity $v_L(0)$ and temperature quotient $\Delta t_L/\Delta t_z$)



Example: Alternating ceiling air discharge without Coanda effect

$V = 50 \text{ m}^3/\text{h lfm}$, $H_1 = 1.5 \text{ m}$, $L = 3.0 \text{ m}$, $\Delta t_z = -6 \text{ K}$

Determining the air velocity v_{H1} :

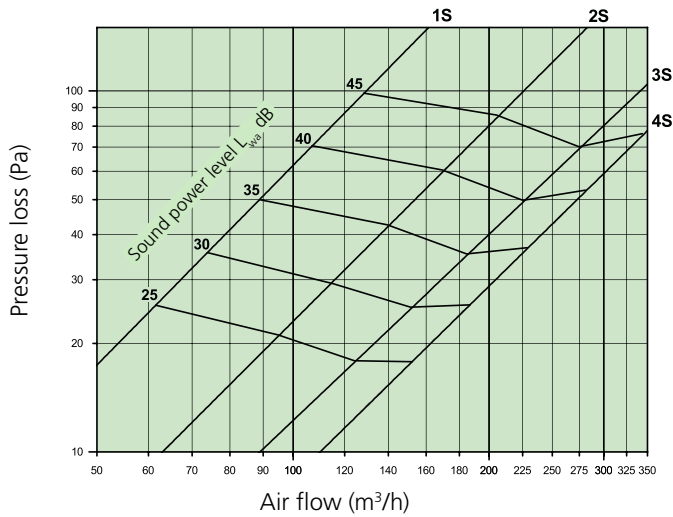
Diagram 4 shows $v_{H1}(0) = 0.12 \text{ m/s}$ and $\Delta t_L/\Delta t_z = 0.033 = |\Delta t_L| = (-6) \times 0.033 = 0.2 \text{ K}$,

Table (K_1) shows $K_1 = 0.04 \text{ m/s}$

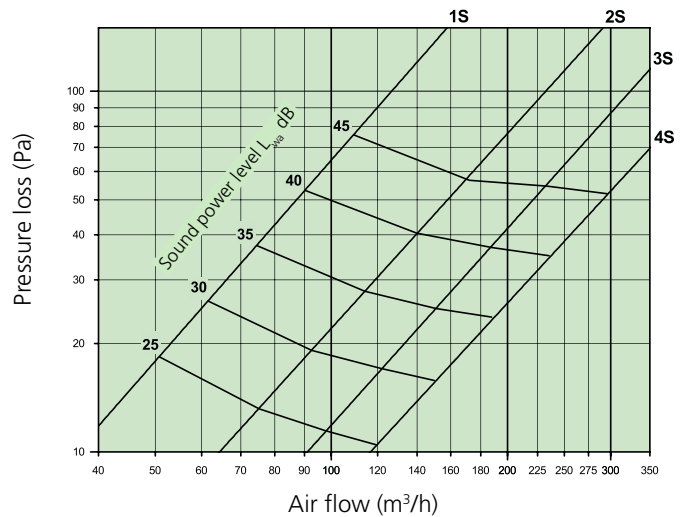
The air velocity is calculated as follows:

$$v_{H1} = v_{H1}(0) + K_1 = 0.12 + 0.04 = 0.16 \text{ m/s}$$

Vertical distribution pattern



Horizontal distribution pattern



Sound power level

Size	Sound level correction in dB in the octave band, Hz							
	63	125	250	500	1000	2000	4000	8000
600	-7	2	-2	-3	-4	-10	-21	-25
900	-8	4	1	-3	-7	-7	-16	-25
1200	-7	5	1	-2	-6	-7	-16	-25
1500	-6	5	2	-2	-6	-8	-18	-25

Insertion loss (incl. reflection loss)

Size	Insertion loss in dB in the octave band, Hz							
	63	125	250	500	1000	2000	4000	8000
600	23	18	11	13	15	8	4	6
900	24	9	11	14	15	9	5	8
1200	20	13	12	13	15	6	6	7
1500	20	14	13	13	16	7	7	7

Dimensions

Number of slots	Plenum box variant	$\varnothing d$ (mm)	C (mm)	H (mm)	h (mm)	B (mm)
1	A	98	90	190	120	15
	B	123	90	215	145	
2	A	123	105	215	145	30
	B	138	105	230	160	
3	A	138	120	230	160	45
	B	158	120	250	180	
4	A	158	135	250	180	60
	B	198	135	290	220	

The specified measurements refer to the external dimensions (mm). These can be adjusted within functional limits to meet specific requirements.

Spigot length 50 mm.

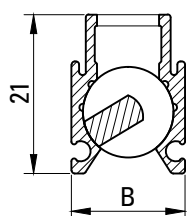


Figure 1. Dimensions, VZ-15 without support profiles (mm).

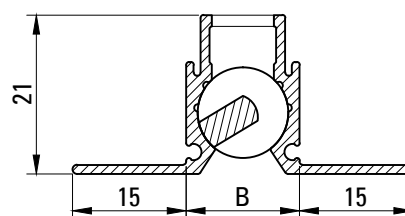


Figure 2. Dimensions, VZ-15 with support profiles (mm).

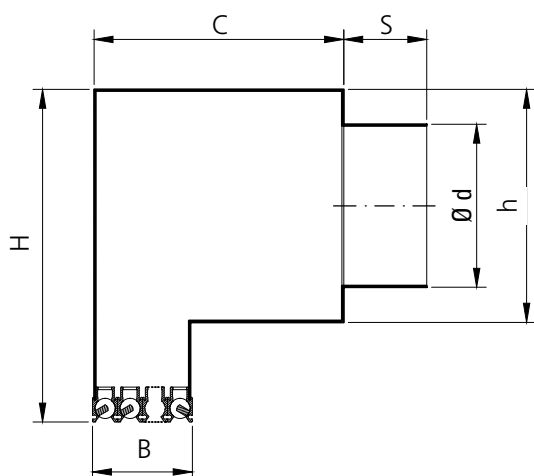


Figure 3. Dimensions, VZ-15 with plenum box (mm).

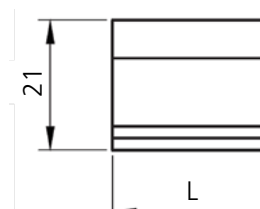


Figure 4. Dimensions, profile width (mm).

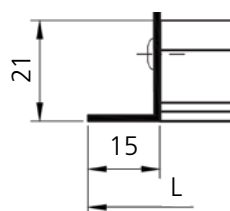
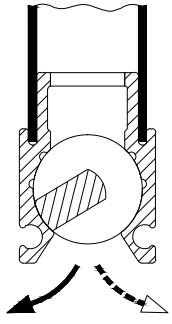
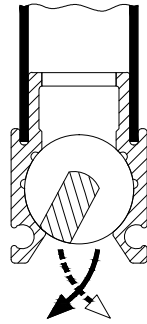


Figure 5. Dimensions, profile width with end angles (mm).

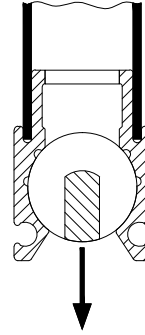
Adjustable air discharge directions



Horizontal ceiling

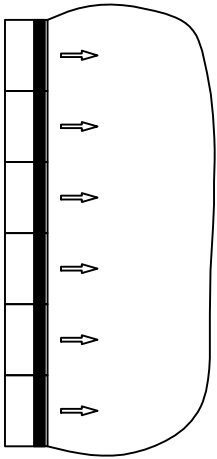


Free (45°)

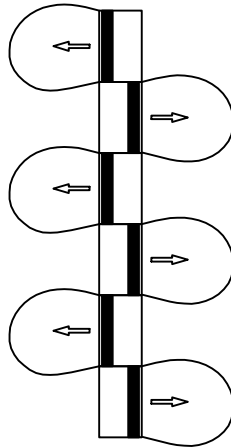


Vertical

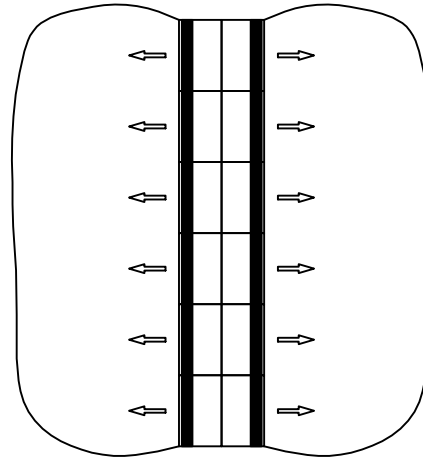
Distribution patterns



1-way.

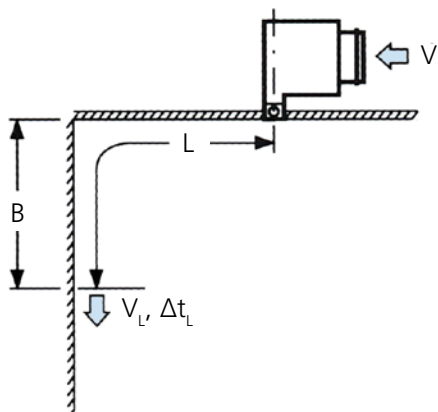


Diffuse.



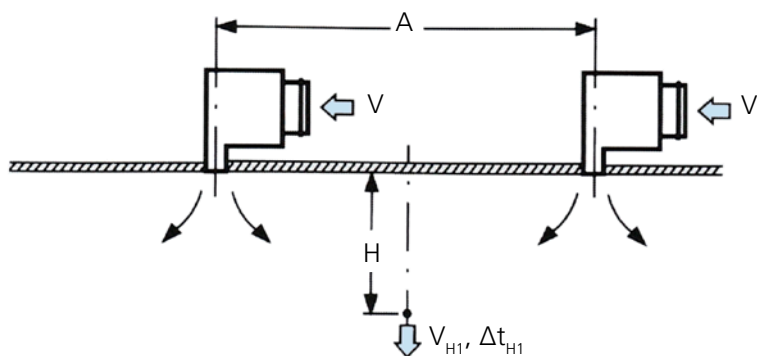
2-way.

Single-sided ceiling distribution pattern

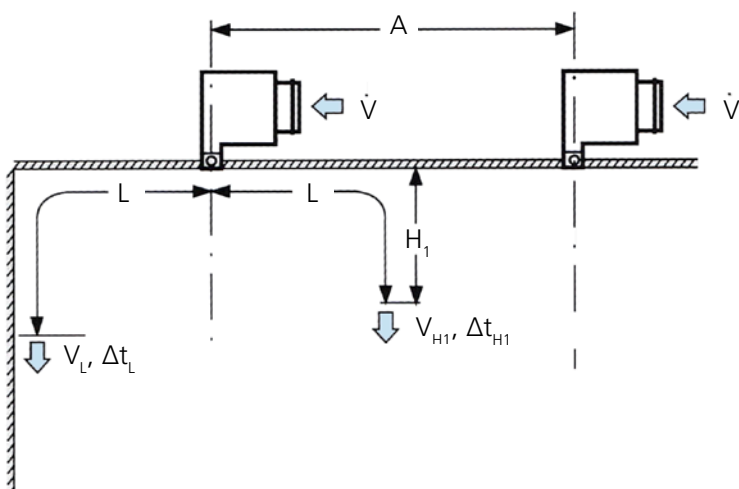


- V (m³/h): Air flow
- L (m): Distance from slot diffuser
- A (m): Spacing between two slot diffusers
- B (m): Infiltration depth from the ceiling along the wall
- H₁ (m): Infiltration depth from the ceiling between two slot diffusers
- v_L (m/s): Air velocity at distance L
- v_L (0) (m/s): Air velocity at distance L with isothermic air supply (Δtz = 0 K)
- v_{H1} (m/s): Air velocity between two opposite slot diffusers at infiltration depth H1
- v_{H1} (0) (m/s): Air velocity between two opposite slot diffusers at infiltration depth H1 with isothermic air supply (Δtz = 0 K)
- K₁ (m/s): Correction value for non-isothermic air supply
- Δt(H₁) (K): Difference between air discharge and room temperature at infiltration depth H1
- Δt(H₂) (K): Temperature difference between supply air and room temperature

Diffuse free distribution pattern



Alternating ceiling distribution pattern



Specification

For ordering, contact your local Swegon sales office.

Specification text

Slot diffuser VZ-15 with a system width of 15 mm, intended for wall or ceiling installation with the following features:

- Available with 1 to 4 slots.
- Extruded aluminium profiles rails, painted in white (RAL 9003).
- Available with or without support profiles.
- Fitted with 100 mm long air deflectors, individually adjustable, made in plastic and painted black.
- End angles for covering the ends of the slot diffuser, made of aluminium.
- Plenum box with horizontal or vertical duct connection, made of galvanised steel.
 - Perforated commissioning damper blade in the spigot, actuated by pull cable.
 - Internal insulation, class B1 according to DIN 4102.
 - Rubber seal.