

# Floor Swirls

Models BZD and SZD

## Features

- Model BZD  
Circular Floor Swirl
- Model SZD  
Circular Step Diffuser



# Air Diffusion

Grilles Diffusers Louvres Chilled Beams

Ruskin Air Management Limited  
[www.ruskinuk.co.uk](http://www.ruskinuk.co.uk)

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### Model BZD



#### Model BZD

Circular Swirl Diffuser, having a perforated steel front plate, incorporating a secondary swirl device suitable for most floor applications.

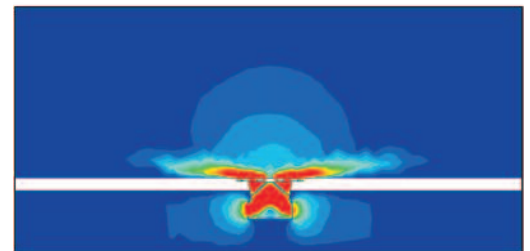
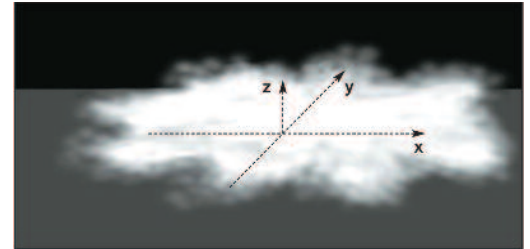
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#### Model SZD

Circular Diffuser having a perforated steel front plate and connecting spigot suitable for most low sidewall/step applications.

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#### Application

The floor diffuser BZD is an air diffuser that can be mounted flush with the floor and be used from low to average temperature differences between supply air and room air.

The diffuser can be used for cooling and heating with a maximum temperature difference of approximately 6K.

Two types of floor diffusers BZD 200 are available:

**BZD** is a diffuser for light load, e.g. underneath permanently fixed seats in cinemas, theatres and concert halls. The supply grille, which is the perforated top element of the diffuser, is manufactured from either steel, powder coated (BZD-N) or stainless steel (BZD-E).

**BZD + BG** incorporates reinforcement for heavy duty (»domestic« according to the European standard for static loading criterias) in open floor areas.

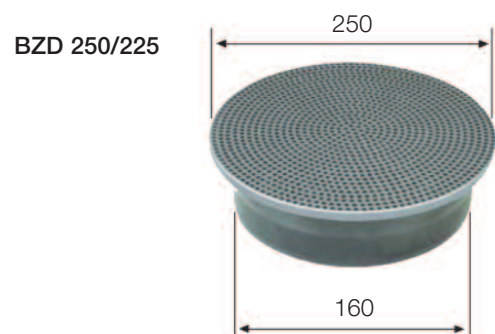
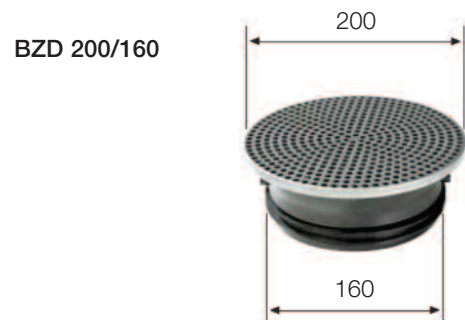
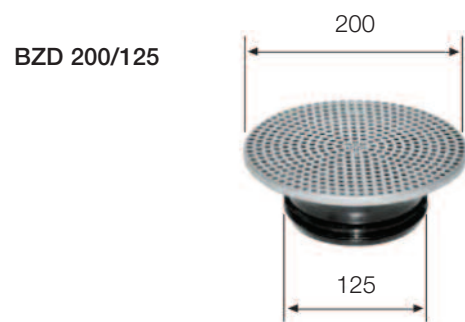
#### Function

The supply air is discharged from the diffuser in eight swirling jets, which flow along the floor.

The air movement is distinguished by a low air velocity without draughts.

The primary induction at the centre point of the diffuser already reduces the temperature difference between supply air and room air as the air is discharged from the diffuser. This primary induction enables the diffuser to operate at a higher temperature difference than is normally possible in the case of floor diffusers.

#### Sizes

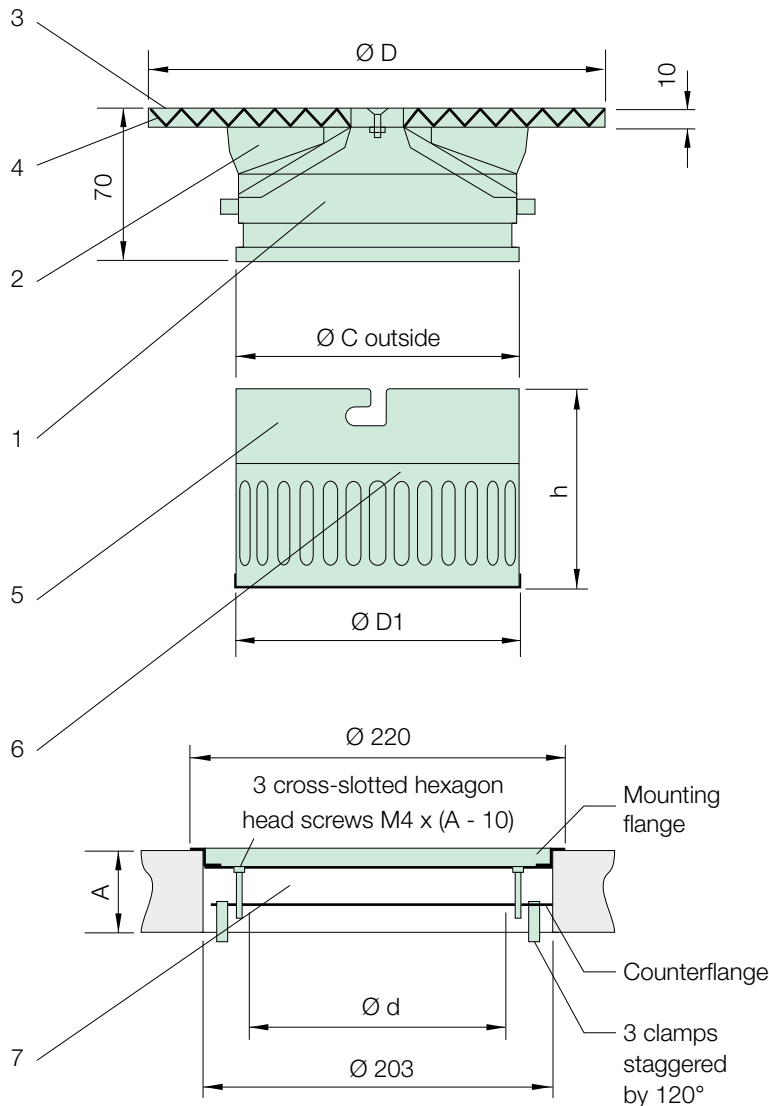


# Model BZD

## Construction BZD 200

The diffuser BZD 200 consists of inlet spigot (1) with integral swirl diffuser (2). The perforated top element is manufactured from steel (3) and is fitted above the swirl diffuser. The heavy duty

type incorporates reinforcement (4). The dirt trap manufactured from steel (5) together with the internal control damper can be fastened to the inlet spigot by means of a bayonet lock.



## Dimensions BZD 200

Component	Dimension BZD (mm)	
	200/125	200/160
D	198	198
C	123	158
D1	130	165
h	90	125
d	150	170

## Components BZD 200



### Floor diffuser BZD 200

Non-reinforced diffuser

**BZD-N** (perforated top element of the diffuser manufactured from steel and powder coated)

**BZD-E** (perforated top element of the diffuser manufactured from stainless steel)

### Floor diffuser BZD 200

Reinforced diffuser

**BZD-N+BG**

**BZS-E+BG**



Dirt trap  
SF



Damper ring  
D



Back plate  
MB



Back plate with floor clamps  
MR



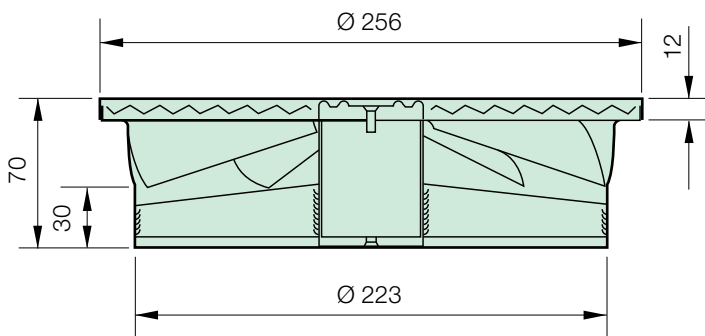
Plenum box  
AK

### Model BZD

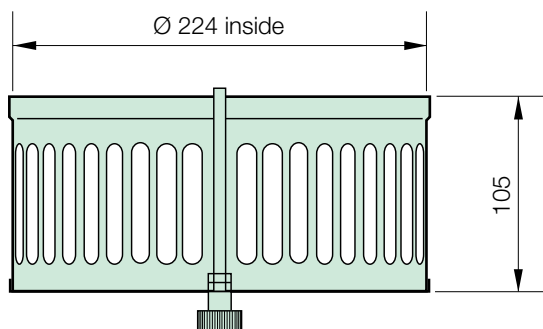
#### Construction and dimensions BZD 250/225

The construction of size 250 is similar to size 200. However, the dirt trap is fastened to the diffuser with a centre screw. Size 250 has a one-piece back plate with three clamping screws fastened to the floor tile.

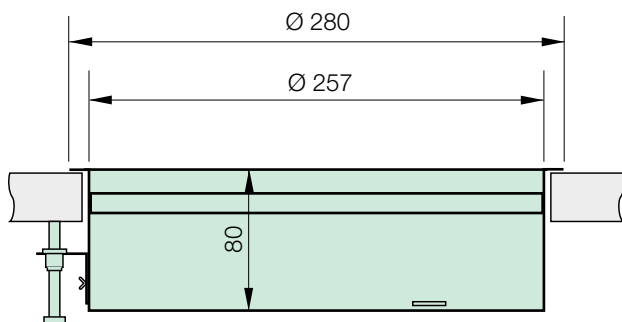
Custom-made mounting frames are available for special installation situations.



**Floor diffuser BZD 250/225**



**Dirt trap for BZD 250/225**



**Back plate for BZD 250/225**

#### Design and surface treatment of the supply grille

The supply grille, which is the perforated top element of the diffuser, is either powder coated or manufactured from stainless steel (standard). The stainless steel surface can be rolled or treated with glass beads.

The perforation of the supply grille can be either 5.5mm or 4.5mm in diameter.



**5.5mm perforated face with centre screw, rolled stainless steel surface**



**4.5mm perforated face with clamp fastening at the side**

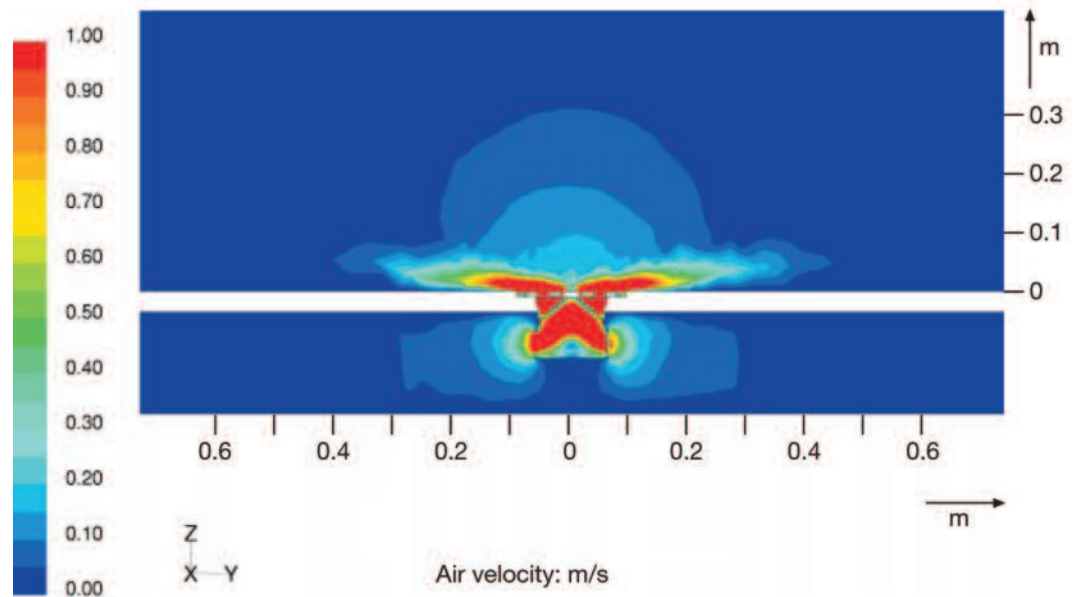
# Model BZD Performance

## Functional diagram

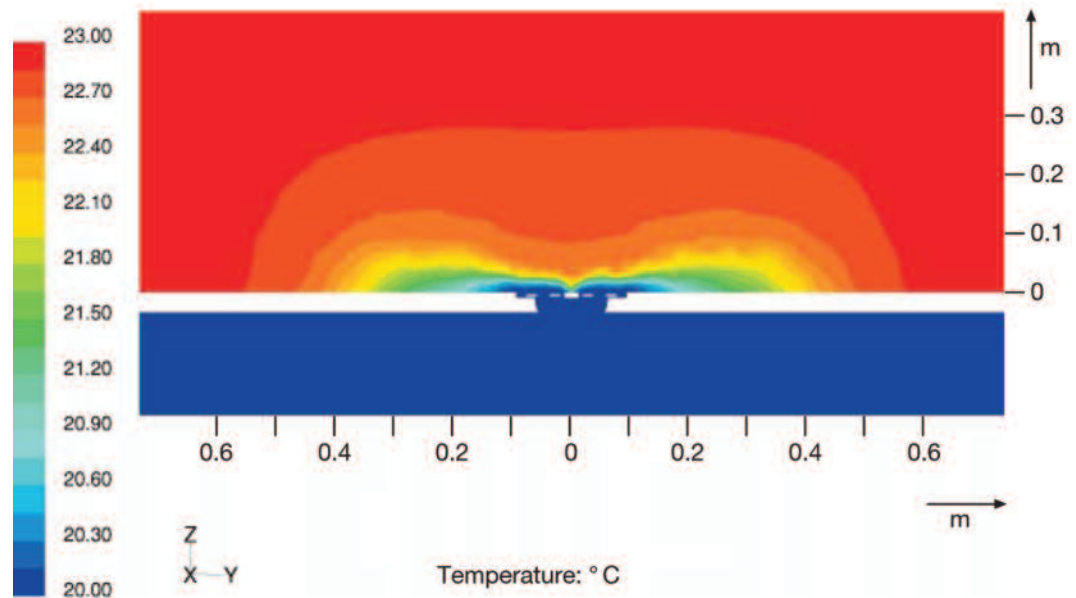
To represent the function of the floor diffusers Type BZD, Figure 1 and 2 show the vertical sections for the temperature and velocity distribution for the diffuser BZD 200/125 by calculating the flow simulation.

Volume flow: 17 l/s.

Temperature difference supply air/room air: 3 K for cooling



**Fig. 1.** Vertical section of velocity distribution BZD 200/125 Volume flow: 17 l/s, temperature difference: 3 K for cooling.



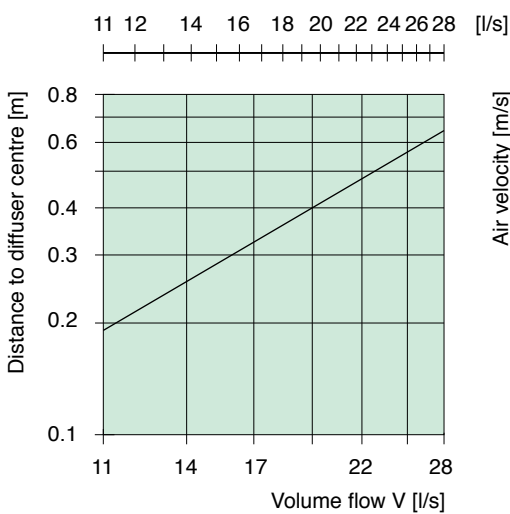
**Fig. 2.** Vertical section of temperature distribution BZD 200/125 Volume flow: 17 l/s, temperature difference: 3 K for cooling.

### Model BZD Performance

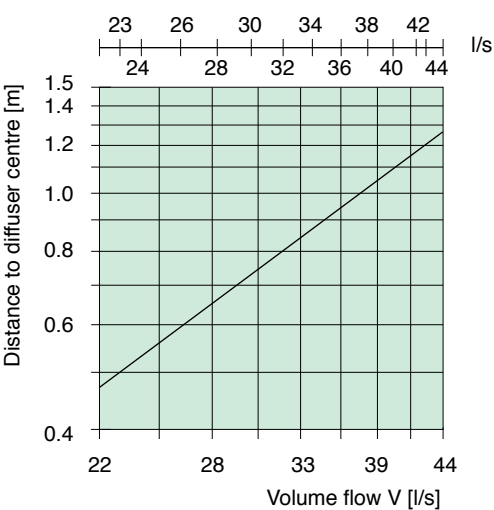
#### Air velocities

The swirling jets of the discharged supply air right above the floor causes a quick reduction of air velocity in the horizontal plain. The maximum air velocities are at a height of 50mm.

Fig. 3 and Fig. 4 show for BZD 200 and BZD 250 the distance, up to which the air velocity at a height of 50mm is decreased to 0.2 m/s. The values are valid for cooling with 3 K.

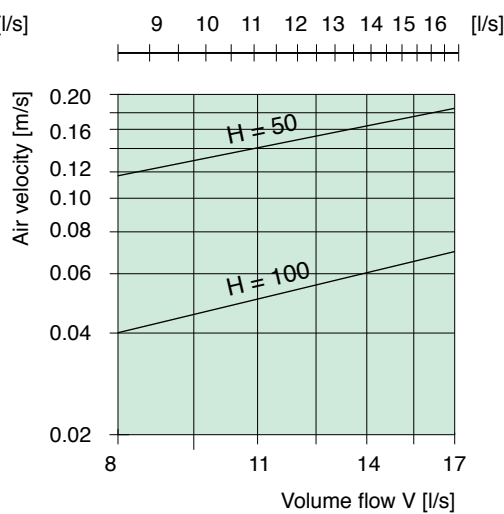


**Fig. 3.** BZD 200, distance from the centre of the diffuser to the point, at which the air velocity at a height of 50mm is reduced to 0.2 m/s.



**Fig. 4.** BZD 250, distance from the centre of the diffuser to the point, at which the air velocity at a height of 50mm is reduced to 0.2 m/s.

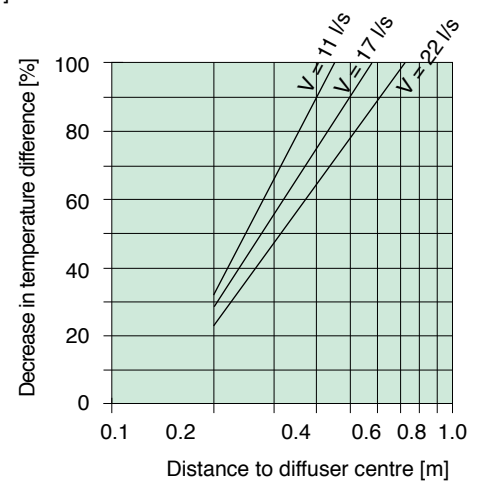
Fig. 5. Local air velocities for BZD 200 at a distance of 450 mm to the centre of the diffuser for volume flows from 8 - 17 l/s with also 3 K for cooling.



**Fig. 5.** BZD 200, local air velocity at a distance of 450mm from the centre of the diffuser for volume flows from 8 to 17 l/s.

#### Decrease in temperature difference supply air/room air

Fig. 6. The rapid reduction in temperature difference and percentage decrease of the temperature difference supply air/room air for BZD 200 for volume flows between 11 and 22 l/s across the distance from the centre of the diffuser. The values are valid for temperature difference between 2 and 4 K.

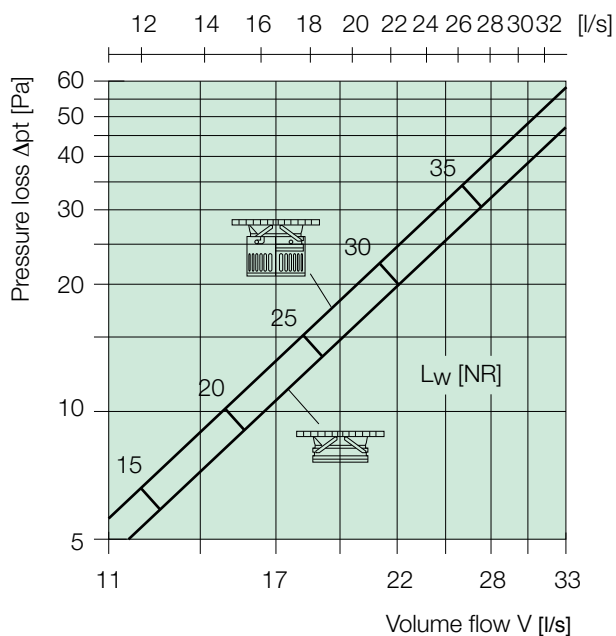


**Fig. 6.** BZD 200, percentage reduction of the temperature difference supply air/room air across the distance from the centre of the diffuser.

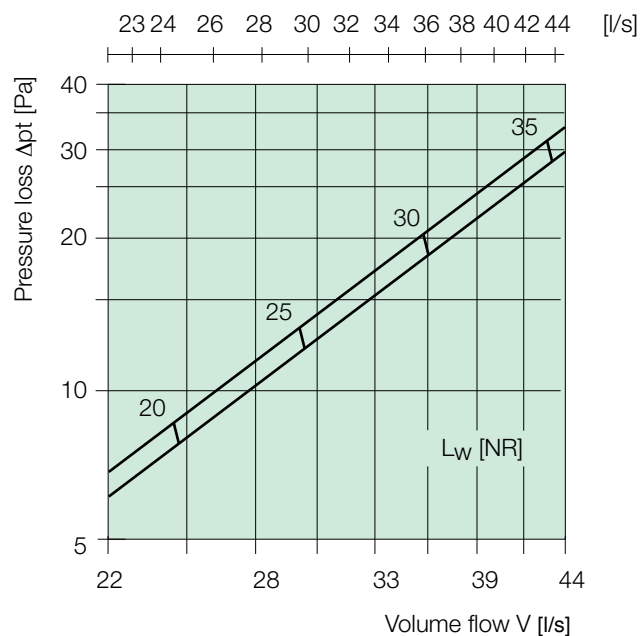
# Model BZD Performance

## Noise level and pressure loss

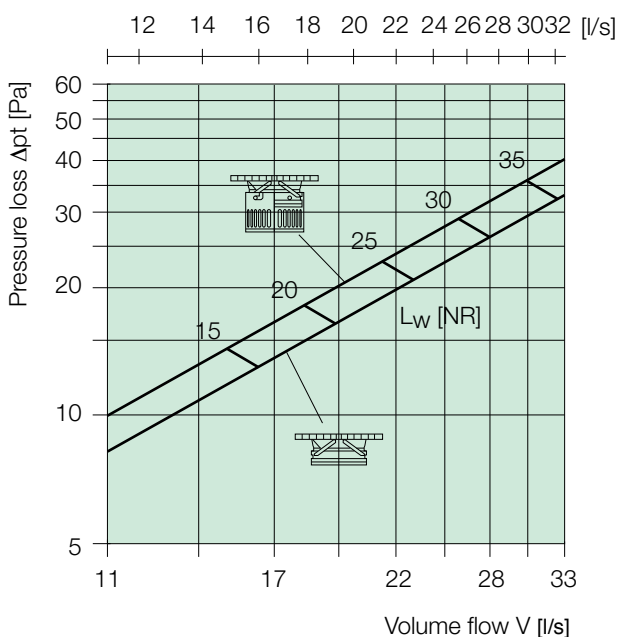
The noise level in NR  $L_w$  and pressure loss in Pa are shown in Figures 7 to 9.



**Fig. 7.**  
BZD 200/125, pressure loss and noise level.

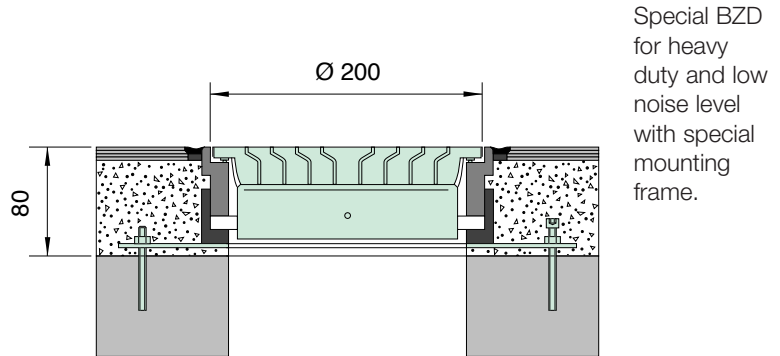
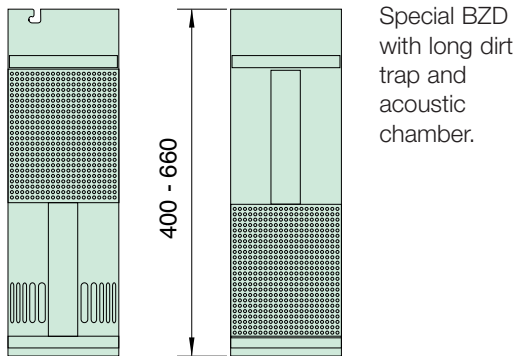
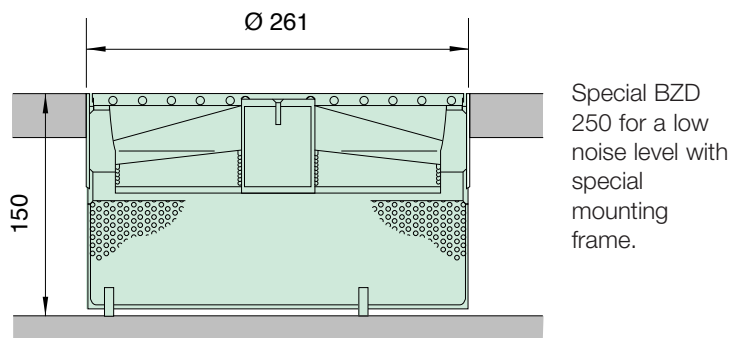
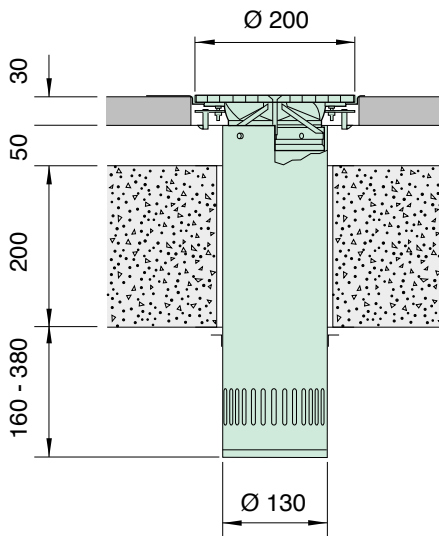
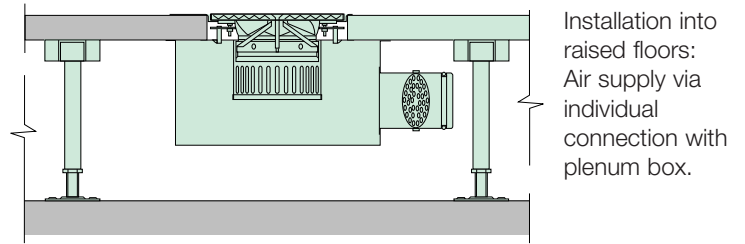
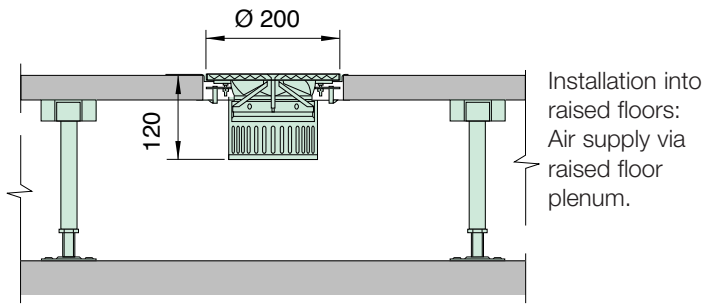


**Fig. 9.**  
BZD 250/225, pressure loss and noise level.



**Fig. 8.**  
BZD 200/160, pressure loss and noise level.

### Model BZD Installation Options



#### Ordering Information Example

Model and Finish	Fixing	Accessories	Size
BZD-E	Central Screw	SF and D	200/160
<b>BZD-E</b> - Perforated Plate in Stainless Steel	Fastening via central screw Clamp fastening using rim	<b>BG</b> - Reinforcement for light load (domestic) <b>MR</b> - Back Plate <b>SF</b> - Dirt Trap <b>D</b> - Damper Ring <b>MR</b> - Back Plate with wall clamps <b>AK</b> - Plenum Box	200/125 200/160 250/225
<b>BZD-N</b> - Steel Perforated Plate, Power Coated to RAL Colour			

**Important Note:** All orders must be addressed to Air Diffusion, Ruskin Air Management Limited.

# Model SZD Staircase Riser

**Application**

The staircase diffuser SZD is designed for draught-free introduction of supply air into cinemas, theatres, lecture halls and other assembly rooms. It is vertically mounted into the steps and introduces the supply air near the ground. The staircase diffuser SZD 125 is used for volume flow rates from 6 to 11 l/s with temperature differences between supply air and room air of up to ±6 K.

**Construction**

The visible part of the staircase diffuser is a round (or square) perforated plate, behind which the diffuser with 8 blades (2) and inlet spigot (3) is located. The perforated plate (4) is used as flow straightener as well as a variable flow controller.

**Function**

The swirling jets leave the diffuser with radial action and flow towards the floor. The air velocity and temperature difference is rapidly reduced. This guarantees draught-free conditions at a short distance between the diffuser and legs of the audience.

**Mounting**

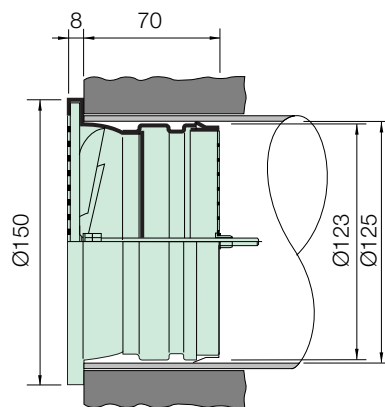
Two types of installation are possible:—

**Front mounting: SZD 125F**

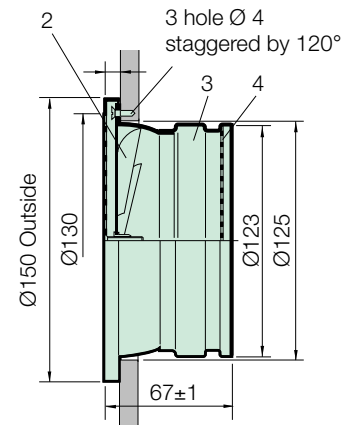
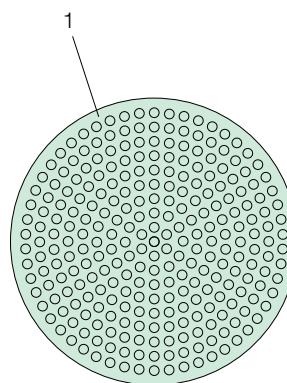
The diffuser is screw fixed to the front side of the step and is then fastened to the diffuser perforated plate.

**Insertion into ductwork: SZD 125R**

The entire diffuser is inserted into a duct having an inside diameter of 125mm and fastened by tightening the middle screw. This enables an easy, quick and extremely inexpensive mounting procedure.



Insertion into ductwork : SZD 125 R



Front mounting: SZD 124 F

## Model SZD

### Velocity profile vs. supply flow rate

The staircase diffuser type SZD is usually used with a volume flow between 5 and 11 l/s. Figure 1 shows the velocity profile of 0.2 m/s for 6, 8, 11 l/s at a temperature difference of 3 K (cooling) between supply air and room air at a height of 100mm.

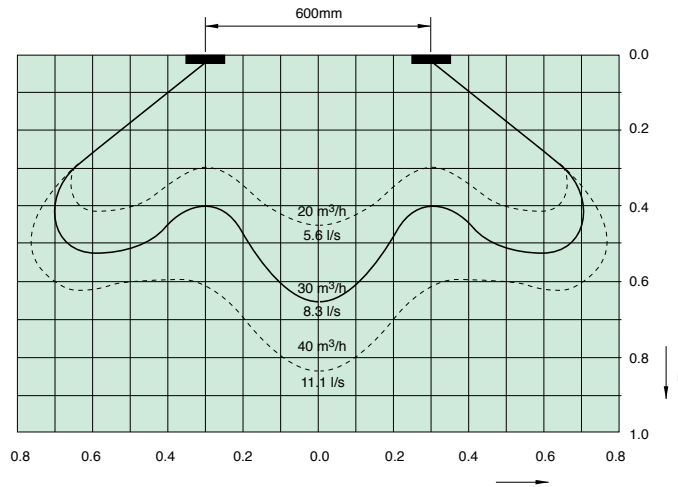


Figure 1

### Velocity profile vs. supply flow rate

The staircase diffuser type SZD is usually used with a volume flow between 6 to 11 l/s. Figure 1 shows the velocity profile of 0.2 m/s for 6, 8, 11 l/s at a temperature difference of 3 K (cooling) between supply air and room air at a height of 100mm.

### Pressure loss and noise level

Figure 2 shows the pressure loss and noise level for the individual diffuser against volume flow. The diffuser resistance can be varied without affecting the noise level by changing the free air of the perforated plate.

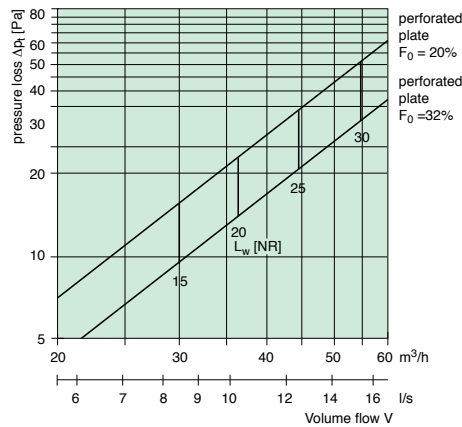


Figure 2

### Ordering Information Example

Model	Finish	Fixing	Size
SZD	White (RAL9010)	Duct Mounting	125

**SZD**- Standard stair riser consisting of a perforated front plate, base plate having punched swirl vanes and an inlet spigot of 125mm diameter.

Standard finish is powder coat white to RAL9010

Fastened to duct using diffuser spigot  
Front fastening using spigot screws

200/125  
200/160  
250/225

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## Product Range



- Modular Active Chilled Beams
- Ceiling Swirl Diffusers
- Displacement Ventilation Units
- High Induction Slot Diffusers
- Square Louvre Face Diffusers
- Perforated Diffusers
- Linear Slot Diffusers
- Fixed Blade Linear Diffusers
- Cylinder Jet Diffusers
- Jet Nozzle Diffusers
- Circular Adjustable and Fixed Diffusers
- Air Valves
- Panel Floor Grilles
- Linear Floor Grilles
- Floor Swirl Diffusers
- Wall and Ceiling Grilles
- External Weather Louvres
- Systempac – Fan Coil Unit and Diffuser Package

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Due to a policy of continuous product development the specification and details contained herein are subject to alteration without prior notice.

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## **Air Diffusion**

Grilles Diffusers Louvres Chilled Beams