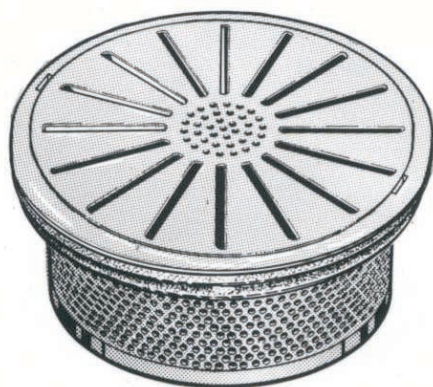


Please note,
type code is new,
see last page.

Technical Selection



Floor displacement outlet Q-B-DN 200

Preliminary remarks

Floor displacement outlets are usually used where wall or plinth displacement outlets cannot be installed for reasons of space and a raised floor has been installed. The Q-B-DN 200 floor displacement outlet is suitable for the relatively large volume flow rate range up to 28 l/s (100 m³/h). The air outlet is made of aluminium and is intended for installation in conventional raised floor systems.

Construction design

The Q-B-DN 200 floor displacement outlet consists of the circular air outlet element **1** with 16 outer air slots **1a** and a perforated air outlet centre **1b**. It can either be inserted in the stepped bore **9a** or, using a clamp insert **5**, in the through bore **9b** of the floor tile. The clamp insert has a protective collar **6** on the top which functions as edging for the tile cutout. This is particularly useful for raised floors with carpeting.

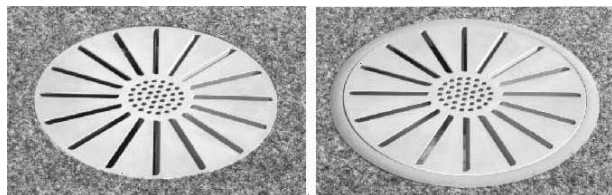


Figure 1: Floor displacement outlet in a floor tile;

Left: In a stepped bore

Right: In a through bore with clamp insert

The clamp insert can be fastened to the floor tile with a claw fastener **5b** or a clamp collar **5d**. The air outlet element can also be locked to prevent unauthorized removal.¹⁾

A standard floor displacement outlet is supplied with a distributor basket **2** for even air supply. There are different types to choose from (Figure 2):

- Standard design, with throttle device: Type VSD (without throttle device: Type VS)
- Short type, for raised floors with lower plenums; without throttle device: Type VK
- Low type, with openable basket bottom to enable additional air supply from below, best for raised floors with thicker tiles and lower plenums, with throttle device: Type VND (without throttle device Type VN)
- Perforated sheet metal type for metal floor air outlets, with throttle device: Type VPD

When the floor plan is altered the floor tiles with air outlets can be easily exchanged for tiles without air outlets. The local air supply into the room can therefore be increased or reduced as required.

The supply air is fed to the floor displacement outlet via the distributor basket. The space under the raised floor acts as a pressurized plenum. The floor displacement outlet can also be connected via a rectangular connection box **7** with flexible tubing to the supply air ductwork.

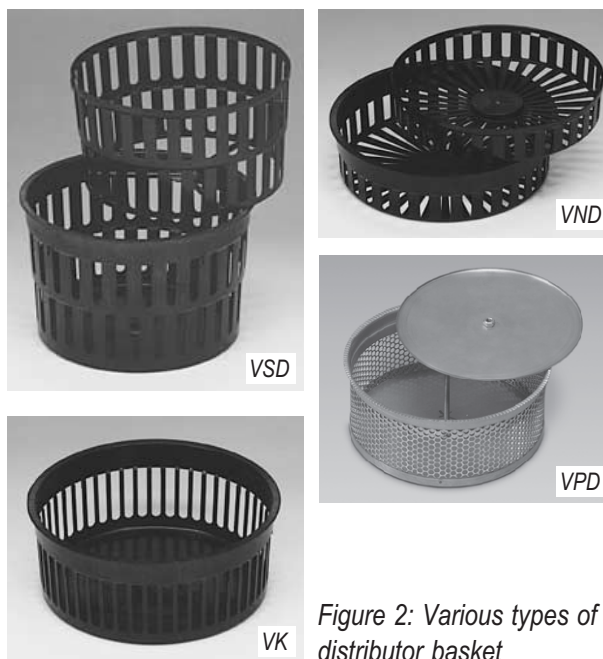


Figure 2: Various types of distributor basket

Technical data

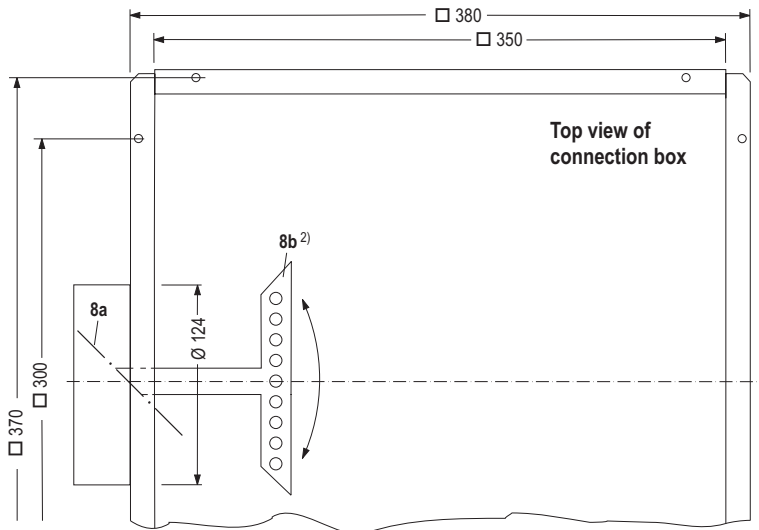
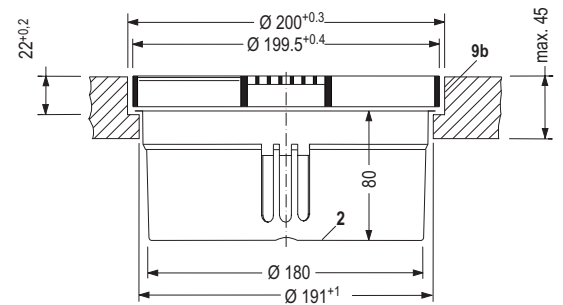
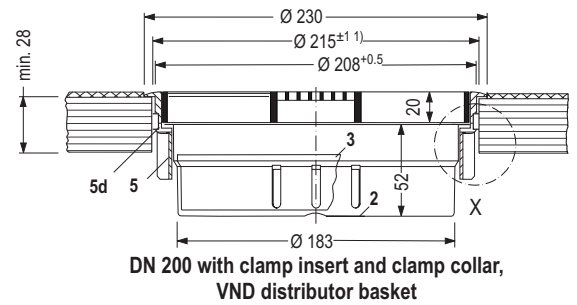
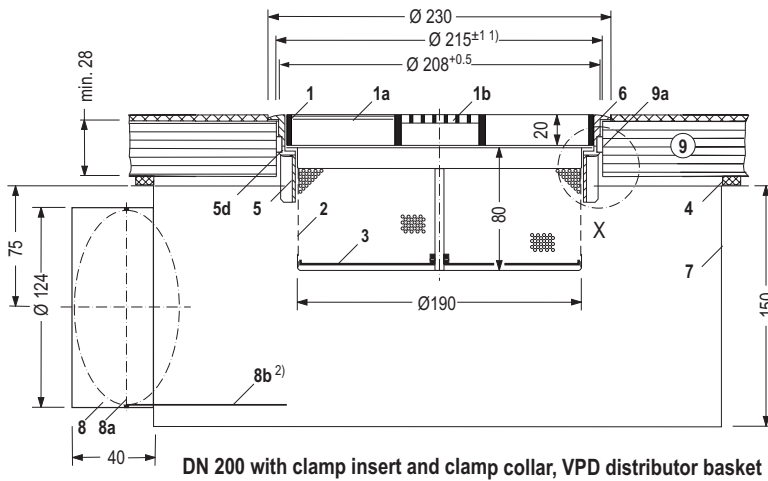
Air outlet volume flow rate \dot{V}_A :	$\leq 28 \text{ l/s (100 m}^3\text{/h)}$
Nominal-Ø = Installation-Ø:	DN 200
Supply air temperature:	$\vartheta_{ZL} \geq 20^\circ\text{C}$
Temperature difference between	
– supply air–indoor air ²⁾	$\Delta\vartheta: -1 \text{ to } -4 \text{ K}$
– supply air–return air ³⁾	$\Delta\vartheta: \leq -7 \text{ K}$
Coverage radius of a floor displacement outlet:	4 – 5 m
Weight of air outlet:	0.8 kg
Bearing strength ⁴⁾ of air outlet element:	1500 kg

1) For the required air outlet type (kind, material, etc.) or possible combination of individual components see table on page 6, "Types available"

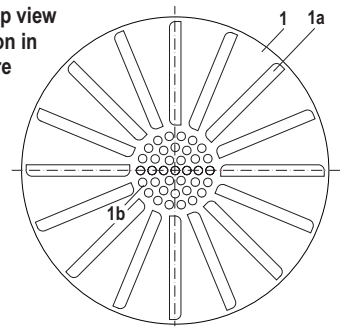
2) At head height of a seated person

3) For room heights up to approx. 3 m; otherwise higher $\Delta\vartheta$ possible.

4) With vertical single load on a central indent of 50 mm diameter

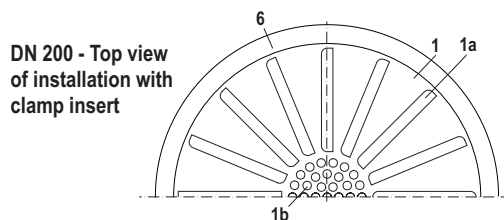
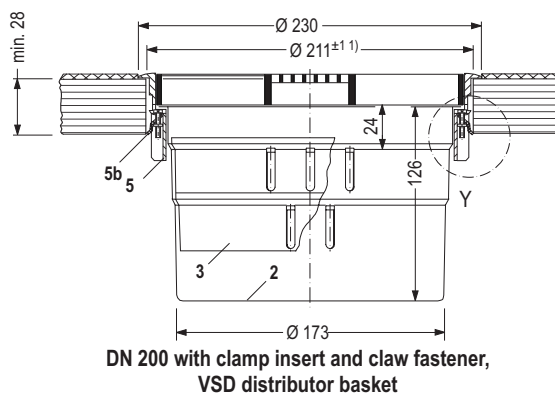
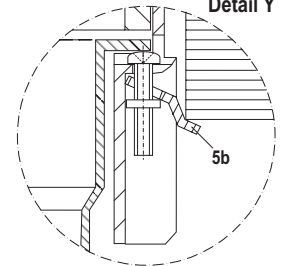
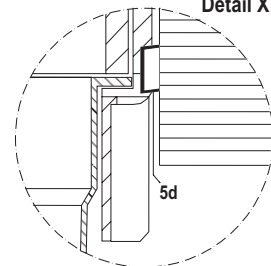


DN 200 – Top view of installation in stepped bore



Detail X

Detail Y



Key for all pages:

- | | | |
|----------------------|---------------------|------------------------|
| 1 Air outlet element | 5 Clamp insert | 8a V-damper (optional) |
| 1a Air slots | 5b Claw fastener | 8b Slide 2) |
| 1b Air outlet centre | 5d Clamp collar | 9 Floor tile |
| 2 Distributor basket | 6 Protective collar | 9a Through bore |
| 3 Throttle device | 7 Connection box | 9b Stepped bore |
| 4 Sealing (on site) | 8 Connection spigot | |

Notes: Any distributor basket can be used for the respective installation options. Likewise connection box 7 can be used for the air outlet placement in the other figures.

- 1) Ø 211+1 for fastening with claw fastener, Ø 215+1 for clamp collar fastener
2) The slide 8b is adjustable from the room

Mode of operation

The supply air flows into the distributor basket and then through the radial air slots and the perforated air outlet centre into the room. The special shape of the slots deflects the air jets, which slide along the floor (Figure 3). The result is a low-turbulence horizontal, radial supply air flow at low velocity.

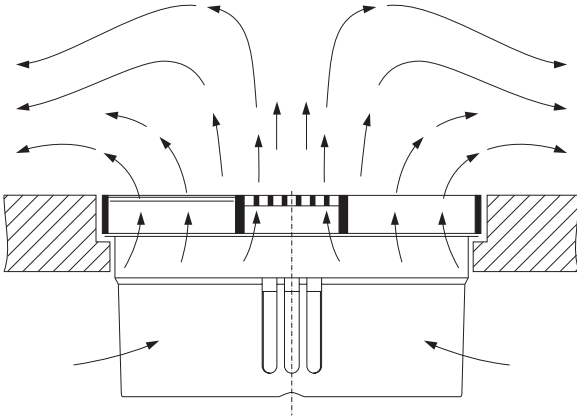


Figure 3: Floor displacement outlet, jet pattern

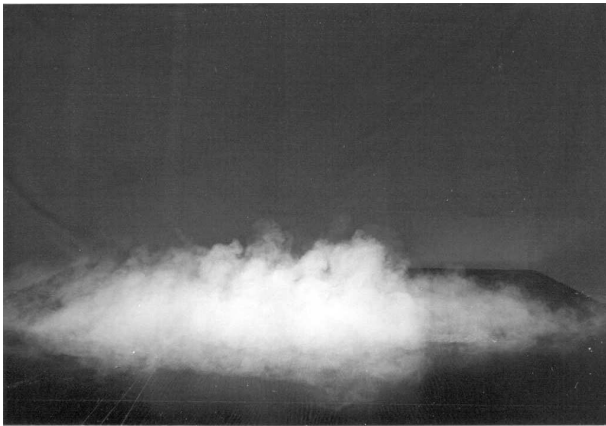


Figure 4: Low-turbulence horizontal, radial jet dispersion, made visible with smoke tracer

Figure 5 shows the air velocities measured in the near zone of the air outlet for two air volume flow rates. Already at an approximate distance of 0.5 m from the air outlet they are low and permissible indoor air velocities to DIN 1946, Part 2 (01.94) are not exceeded. Despite the low air velocities, we recommend a minimum spacing between air outlets and the next seat of 0.8 m. This prevents the seat obstructing jet dispersion and possibly resulting in impaired thermal comfort for the occupants.

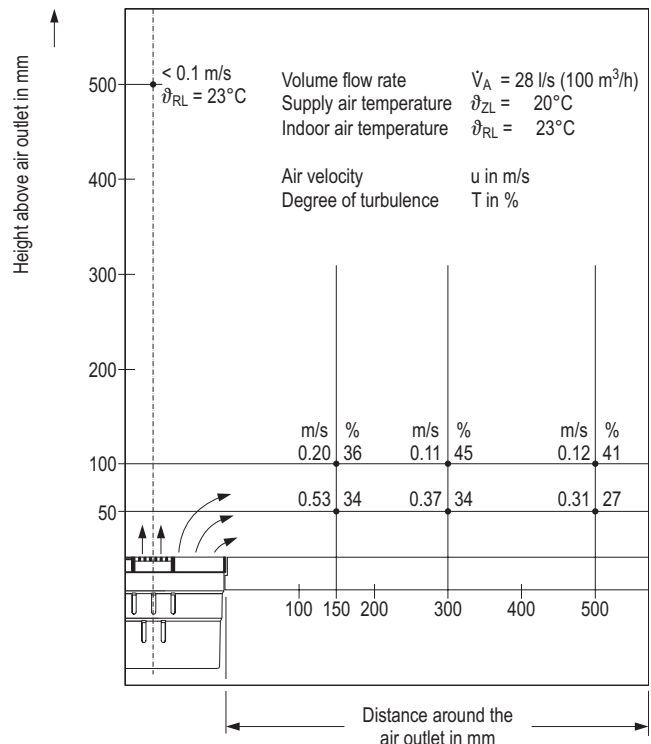
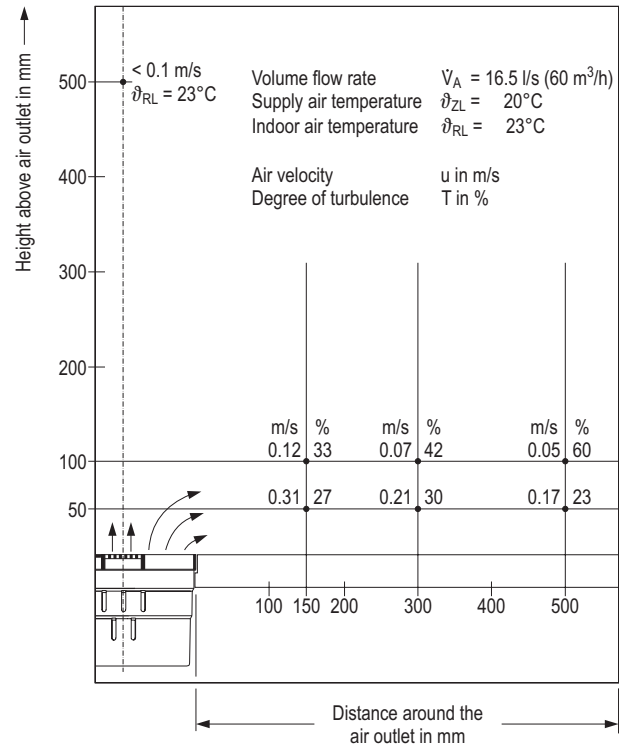
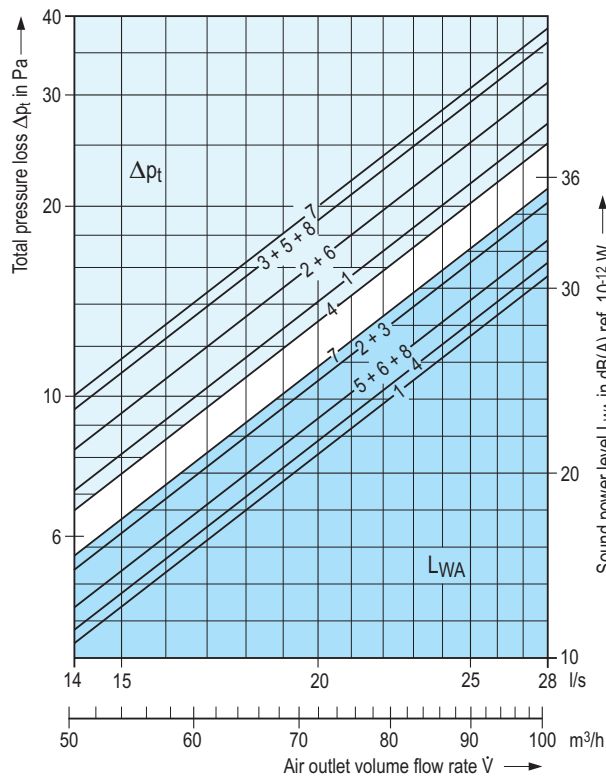


Figure 5: Air velocities above the floor with different volume flow rates \dot{V}_A per an air outlet,
Above: $\dot{V}_A = 16.5 \text{ l/s (60 m}^3/\text{h)}$
Below: $\dot{V}_A = 28 \text{ l/s (100 m}^3/\text{h)}$

Sound power level and pressure loss ¹⁾

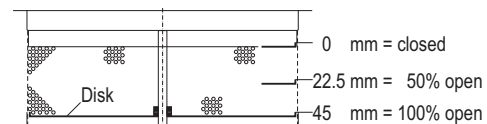
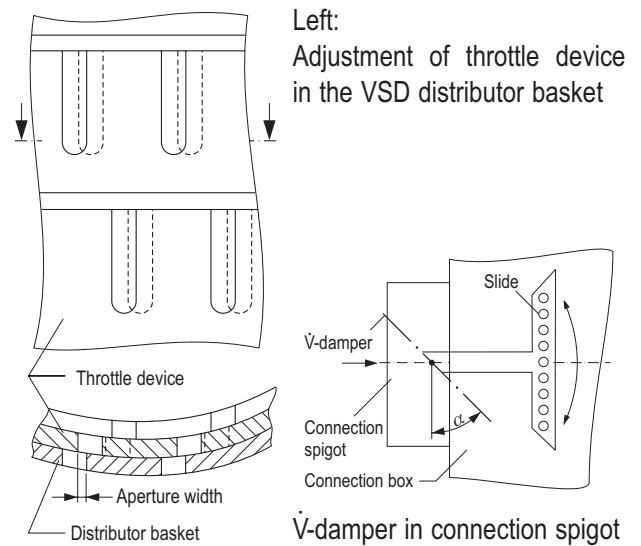


No.	Air outlet volume flow rate		Total pressure loss Δp_t Pa	Sound power level in dB ref. 10^{-12} W							
	\dot{V}_A l/s	\dot{V}_A m^3/h		L_{WA} dB(A)	Octave band centre frequency in Hz						
					63	125	250	500	1 K	2 K	4 K
1	16.5	60	10	16	24	21	20	14	10	—	—
	22	80	17	24	32	29	28	22	18	—	—
	28	100	27	30	38	36	34	28	24	12	—
2	16.5	60	11	20	26	26	25	18	12	—	—
	22	80	20	28	34	34	33	26	20	—	—
	28	100	31	34	40	40	39	32	26	14	—
3	16.5	60	13	20	26	27	25	17	12	—	—
	22	80	23	28	34	35	33	25	20	—	—
	28	100	36	34	40	41	39	31	26	12	—
4	16.5	60	9	17	25	22	20	14	12	—	—
	22	80	16	25	33	30	28	22	20	—	—
	28	100	25	31	39	36	34	28	26	12	—
5	16.5	60	13	18	25	22	20	15	14	—	—
	22	80	23	26	33	30	28	23	22	12	—
	28	100	36	32	39	36	34	29	28	18	—
6	16.5	60	11	18	23	23	23	15	12	—	—
	22	80	20	26	31	31	31	23	20	—	—
	28	100	31	32	37	37	37	29	26	12	—
7	16.5	60	14	21	23	24	25	17	17	—	—
	22	80	25	29	31	32	33	25	25	14	—
	28	100	37	36	38	39	40	32	32	21	—
8	16.5	60	13	18	21	23	23	15	12	—	—
	22	80	23	26	29	31	31	23	20	—	—
	28	100	36	32	35	37	37	29	26	11	—

Insertion loss in dB									
Size	Octave band centre frequency in Hz								Mean value
	63	125	250	500	1 K	2 K	4 K	8 K	
DN 200	4	1	0	2	3	5	6	5	3
DN 200	1	1	2	3	2	3	4	5	3

Key to graphs

No.	Size	Type	Distributor basket		\dot{V} -damper in connection spigot Damper angle α
			Throttle device ²⁾ % open	Aperture width / Disk lift mm	
1	DN 200	VSD	100	8	— ³⁾
2			100	8	90° open
3			100	8	45°
4	DN 200	VPD	100	45.0	— ³⁾
5			50	22.5	— ³⁾
6			100	45.0	90° open
7			50	22.5	90° open
8			100	45.0	45°



Adjustment of throttle device (disk) in the VPD distributor basket

- The sound power level and pressure loss pertain to the use of the VSD and VPD distributor baskets. When the VK and VND distributor baskets are used the values approximate those for the VSD distributor basket or remain within the permissible measuring tolerances.
- The throttle devices in the distributor baskets enable continuous volume flow reduction, preferably up to 50% as well as full shutoff
- Without connection box

	Without connection box
	With connection box

Floor displacement outlet

Types available, features

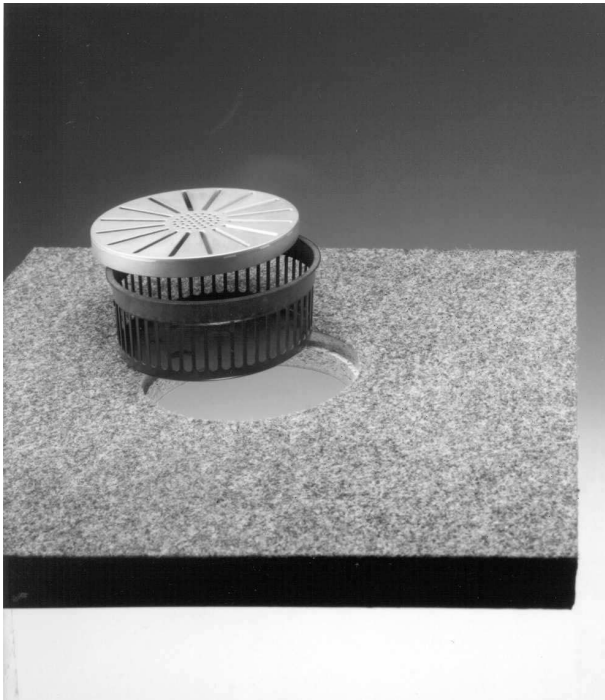


Figure 6: Floor displacement outlet Q-B-DN 200, installation example: Short distributor basket VK and floor tile with stepped bore



Figure 7: Floor displacement outlet Q-B-DN 200, installation example: Perforated sheet metal distributor basket VPD with throttle device and floor tile with clamp insert in a through bore; below it connection box for duct connection

Types available

Floor displacement outlet		Materials ¹⁾		
Component		PC	Al	St
Air outlet element DN 200			●	
For installation in through bore:				
Clamp insert				
– with clamp collar	SR		● ⁵⁾	
– with claw fastener	SK		● ⁵⁾	
For installation in through bore and stepped bore:				
Distributor basket				
– Standard type	VS	●		
– with throttle device	VSD	●		
– Short type	VK	●		
– Low type	VN	●		
– with throttle device	VND	●		
– Perforated sheet metal type				
– with throttle device	VPD			●
Connection box				
– without V-damper in connection spigot				●
– with V-damper in connection spigot ²⁾				●

● = available

Features

- Suitable for displacement ventilation in the commercial sector
- Installation in conventional raised floor systems
- Air supply direct from the pressurized plenum or via connection box with flexible tubing
- Low-turbulence horizontal, radial jet dispersion over floor
- For air volume flow rates to 28 l/s (100 m³/h)
- Coverage radius of 4 to 5 m
- Temperature difference between:
 - supply air–indoor air –1 to –4 K
 - supply air–return air ≤ –7 K ⁶⁾
 depending on heat load and room height
- Floor installation by insertion in a stepped bore or installation with a clamp insert in a through bore of floor tile
- Fastening of clamp insert to floor tile either with clamp collar or claw fastener
- Air outlet element and clamp insert made of aluminium, connection box made of galvanized steel
- Air outlet element can be locked against unauthorized removal
- Distributor baskets made of polycarbonate or galvanized steel with or without throttle or shutoff device
- Can be walked over, driven over and can support a wheelchair

¹⁾ PC = polycarbonate; Al = aluminium; St = galvanized steel

²⁾ V-damper unnecessary for distributor basket with throttle device

⁵⁾ Lock optional

⁶⁾ For room heights to approx. 3 m; otherwise higher Δ*t* possible

Type code

Q - B - DN 200 - ____ - ____ - ____
 Displacement outlet Kind / Function Size Distributor basket Clamp insert Connection type

Please note,
type code is new,
see last page.

Kind / Function

B = Floor displacement outlet

Distributor baskets

VS = Standard type
 VSD = Standard type with throttle device
 VK = Short type
 VN = Low type
 VND = Low type with throttle device
 VPD = Perforated sheet metal type with throttle device

Clamp insert

SO = Without clamp insert (installation in stepped bore)
 SK = Clamp insert with claw fastener for all floors
 SR = Clamp insert with clamp collar for all floors

Connection type

D = Pressurized plenum
 K = Connection box

☐ Standard distributor basket with surrounding slots in basket casing ☐ including throttle device for full shutoff of air outlet.

☐ Short distributor basket with surrounding slots in basket casing, best for low raised floors, without throttle device.

☐ Low distribution basket with surrounding slots in basket casing and openable bottom, best for raised floors with thicker tiles and lower plenums, ☐ including throttle device.

☐ Perforated sheet metal distributor, best used for floor air outlets made of metal, including throttle device.

☐ Clamp insert for installation in through bore of floor tile, ☐ with clamp collar. ☐ with claw fastener. ☐ Air outlet element secured against unauthorized removal.

☐ Connection box for direct connection of air outlet to a flexible tube, ☐ with V-damper adjustable from room.

Materials:

– Air outlet element: aluminium
 – Clamp insert: aluminium
 – Distributor basket: ☐ galvanized steel
 ☐ polycarbonate
 – Connection box: galvanized steel

Colour of visible air outlet parts:
 aluminum-natural colour;
 powder coating on request

Technical data:

Volume flow rate: l/s (m³/h)
 Perm. sound power level: dB(A) ref. 10⁻¹² W
 Bearing strength: ²⁾ 1500 kg

Make: KRANTZ KOMPONENTEN

Type: Q - B - DN 200 - ____ - ____ - ____

Tender text ¹⁾

..... unit
 Floor displacement outlet for low-turbulence horizontal, radial supply air flow over the floor, installed in floor tiles of conventional raised floor systems, air outlet can be walked over, driven over and can support a wheelchair, consisting of:
 circular air outlet element with radial air slots and perforated air outlet centre,

Subject to technical alterations!

1) For the required air outlet type (kind, material, etc.) or possible combination of individual components see table on page 6, "Types available"
 2) With vertical single load on a central indent of 50 mm diameter



Floor displacement outlet with clamp insert

Type code

Q-B - DN 200 -

Floor displacement outlet

Size

Distributor basket

Damper

Clamp insert

Connection type

Distributor basket

VS = Standard type
VK = Short type
VL = Short type with fixed damper
VN = Low type
VP = Perforated sheet metal type

Damper

O = no volume flow damper
D = with throttle device

Clamp insert

SO = no clamp insert
SK = Claw fastener
SR = Clamp ring

Connection type

P = Floor plenum
K = Connection box

Subject to technical alteration.