Floor air outlets
Floor outlets for a comfortable climate

Floor outlets from KRANTZ KOMPONENTEN have been in extremely successful use for decades. The air supplied by floor outlets flows up in the same direction as the buoyancy forces generated by occupants, machinery, lighting, etc. Heat, air pollutants and odorous substances are thus displaced from the occupied zone into the ceiling zone and removed with the exhaust air. The exchange of indoor air for conditioned supply air is most effective and the air quality in the occupied zone is extraordinarily high.

Positive experience with floor outlets and ongoing development have produced mature systems and new designs. Today, KRANTZ KOMPONENTEN can provide the right floor outlet for any requirement.

Key for all figures
1 Floor outlet
2 Distributor basket
3 Throttle device
4 Floor insert
5 Clamp insert
6 Protective collar
7 Connection box
8 Connection spigot
9 Raised floor / Floor plenum
10 Flexible branch duct
11 Supply air
12 Induced indoor air
13 Supply air jets
14 Return air
15 Main return air duct in ceiling zone

Floor outlets installed in floor tiles

1) Installation in floor plenum on request
2) Installation in raised floor on request
3) VN, VND, VPD and VL types available for size DN 200
4) VD type for DN 125; VS, VSD, VK, VN, VND, VPD and VL types for DN 200

Left cover photograph by: Luc Saalfeld FOTOGRAFIK, BBK / Sächsischer Künstlerbund, Dresden
Versatile applications

Floor air outlets from KRANTZ KOMPONENTEN are installed in conventional raised floors or in floor plenums.

There are two options for air supply (Fig. 5):

A) "Pressurized plenum" system
The supply air flows from the pressurized plenum beneath the floor into the air outlets (in raised floors and floor plenums).

B) "Duct connection" system
The supply air flows from the duct system via flexible branch ducts and rectangular connection boxes into the air outlets (in raised floors).

The air outlet is installed:

1. either in the stepped bore of a raised floor tile,
2. or in the through bore of a floor tile using a clamp insert, or using a floor insert in floor plenums. The clamp insert and the floor insert have a protective collar on their upper side for bordering the floor cutout around the outlet element. This is particularly suitable for carpeted floors.

Depending on the model, our floor outlets are fitted with a distributor basket or a floor insert; a throttle device for volume flow rate adjustment is available as an optional extra (see Fig. 1 "Selection chart" on page 2).

If the room layout is altered,
- in rooms with raised floors the tiles with outlets and those without outlets can be easily interchanged;
- in rooms with floor plenums it is usual to drill additional boreholes with standard drills, where necessary.
Floor outlets for turbulent mixing air flow

**Floor twist outlet**
Types DB-E-DN 150 and -DN 200

The supply air is discharged vertically upwards via inclined radial slots. The slot incline generates the twist effect which enhances the turbulence and induction effect of the axial-discharge supply air jets.

**Features:**
- High-induction, stable vertical jet with symmetric rotation
- For raised floors, for installation either in a stepped bore or with clamp insert - in a through bore of the floor tile
- Twist element and clamp insert available in plastic and aluminium
- Depending on type, air outlet element fitted with lock against unauthorized removal
- Suitable for connection to a ‘pressurized plenum’ system or - with connection box - to a ‘duct connection’ system
- With distributor basket for even air supply, with or without throttle device for volume flow rate adjustment; type options VS, VSD, VK, VN, VND, VPD, VL (see Fig. 10-14)

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>DN 150</th>
<th>DN 200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air volume flow rate (m³/h) when used by occupants, max.</td>
<td>5.5 – 14 (20 – 50)</td>
<td>14 – 50 (50 – 180)</td>
</tr>
<tr>
<td>-</td>
<td>12.5</td>
<td>42 (150)</td>
</tr>
<tr>
<td>Max. temperature difference</td>
<td>±10</td>
<td>±10</td>
</tr>
<tr>
<td>Supply air temperature °C</td>
<td>18 – 30</td>
<td>18 – 30</td>
</tr>
<tr>
<td>Material 1)</td>
<td>PC²) or Al³) or PC²)</td>
<td>Al³) or PC²) or St</td>
</tr>
<tr>
<td>- Air outlet element</td>
<td>PC²)</td>
<td>Al³) or PC²)</td>
</tr>
<tr>
<td>- Distributor basket</td>
<td>PC²)</td>
<td>Al³) or PC²)</td>
</tr>
<tr>
<td>- Clamp insert</td>
<td>PC²)</td>
<td>Al³) or PC²)</td>
</tr>
<tr>
<td>- Connection box</td>
<td>St</td>
<td>St</td>
</tr>
<tr>
<td>Max. load-bearing capacity 4)</td>
<td>2 500</td>
<td>1 400</td>
</tr>
<tr>
<td>- PC kg</td>
<td>800</td>
<td>600</td>
</tr>
<tr>
<td>Material 1)</td>
<td>PC²) or St</td>
<td>Al³) or PC²)</td>
</tr>
<tr>
<td>For tile size</td>
<td>500 mm x 500 mm</td>
<td>600 mm x 600 mm</td>
</tr>
<tr>
<td>- 500 mm x 500 mm</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>- 600 mm x 600 mm</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Min. air outlet centre spacing, approx. m</td>
<td>0.3</td>
<td>0.6</td>
</tr>
<tr>
<td>Min. spacing from seat to air outlet, approx. m</td>
<td>1</td>
<td>1.5</td>
</tr>
</tbody>
</table>

1) PC = polycarbonate; Al = aluminium; St = galv. sheet metal
2) Other material on request
3) Powder coating on request
4) With reference to a vertical load applied onto the outlet centre, over 50 mm diameter

**Technical layout to DS 1146**

Air jet pattern of DB-E-DN 200

**Principle of turbulent mixing air flow**

The supply air is discharged upwards at high turbulence; the indoor air around the outlet is intensively induced by the axial-discharge air jets. Due to the high induction effect, the jet velocity decays quickly. Supply air and indoor air temperatures equalize rapidly. Turbulent mixing air flow directed upwards is generated (see Fig. 8).

---

1. **Distributor basket**
   - **Standard design**
     - With throttle device: VSD type
     - (Without throttle device: VS type)
   - **Short design**
     - For raised floors with low pressurized plenum height; without throttle device: VK type
   - **Low design**
     - Openable basket bottom for additional air intake from below, best used for raised floors with thicker tiles and low pressurized plenum height, with throttle device: VND type (Without throttle device: VN type); available for size DN 200
   - **Perforated sheet metal design**
     - Best used for floor outlets made of aluminium, with throttle device: VPD type, available for size DN 200
   - **Perforated sheet metal design**
     - Best used for floor outlets made of aluminium, with throttle device: VPD type, available for size DN 200
   - **Connection box for duct connection**

---

Figures:
- **Fig. 8:** Mode of operation of ‘turbulent mixing air flow’
- **Fig. 10-14:** Air jet pattern of DB-E-DN 200
Floor twist outlet -
Field applications

As supplied to: Siemens AG, Transport Techn. Department, Berlin / D; Gemeentelijke Elektriciteits Bedrijven, head office, Tilburg / NL; Lloyds of London, new building, London / GB

DN 150 in an office

DN 150 in an open-plan office (Section), Siemens in Milan / Italy

DN 200 at Windword Technology Center, Alharetta / USA

DN 200 in the administrative building of the First Boston Corp., New York / USA

DN 150 in the control centre of the Nederlandse Spoorwegen Verkeersleiding, Amsterdam / NL
Rotary floor twist outlet
Types DB-D-DN 125 and -DN 200

The rotary floor twist outlet has inclined, partly radial, partly semicircular air slots. The slot incline and the dissimilar slot shapes generate high-induction supply air jets inclined at about 30° to vertical. The jet direction can be individually adjusted by manually rotating the outlet element (Fig. 25-27); thus, the air velocity in the head zone of the person seated next to the outlet can be altered to suit personal requirements, from undetectable air flow to a refreshing breeze.

**Features:**
- High-induction air jet inclined at 30° to vertical; rotatable outlet element
- For raised floors, for installation with clamp insert in a through bore of the floor tile; type DN 200 also designed for installation in a stepped bore
- Twist element and clamp insert available in plastic and aluminium
- Depending on type, outlet element fitted with lock against unauthorized removal
- Suitable for connection to a "pressurized plenum" system or - with connection box - to a "duct connection" system
- With distributor basket for even air supply, with or without throttle device for volume flow rate adjustment; type VD for DN 125 (Fig. 21-22) and type options VS, VSD, VK, VN, VND, VPD, VL for DN 200 (Fig. 10-14)
- With clamp insert and VD distributor basket

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>DN 125</th>
<th>DN 200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air volume flow rate</td>
<td>l/s</td>
<td>m³/h</td>
</tr>
<tr>
<td>- when used by occupants, max.</td>
<td>5.5 – 16.5</td>
<td>14 – 50</td>
</tr>
<tr>
<td></td>
<td>20 – 60</td>
<td>50 – 180</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>42</td>
</tr>
<tr>
<td>Max. temperature difference</td>
<td>K</td>
<td>± 10</td>
</tr>
<tr>
<td>supply air–return air</td>
<td>± 10</td>
<td></td>
</tr>
<tr>
<td>Supply air temperature °C</td>
<td>18 – 30</td>
<td>18 – 30</td>
</tr>
<tr>
<td>Material1)</td>
<td>- Air outlet element</td>
<td>pc2) or pc3)</td>
</tr>
<tr>
<td>- Distributor basket</td>
<td>pc2) or St</td>
<td></td>
</tr>
<tr>
<td>- Clamp insert</td>
<td>pc2) or St</td>
<td></td>
</tr>
<tr>
<td>- Connection box</td>
<td>St</td>
<td></td>
</tr>
<tr>
<td>Max. load-bearing capacity4)</td>
<td>kg</td>
<td>1 200</td>
</tr>
<tr>
<td>- Al</td>
<td>kg</td>
<td></td>
</tr>
<tr>
<td>- PC</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>- Al</td>
<td>kg</td>
<td></td>
</tr>
<tr>
<td>- PC</td>
<td>1 200</td>
<td></td>
</tr>
<tr>
<td>- Al</td>
<td>kg</td>
<td></td>
</tr>
<tr>
<td>- PC</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>For tile size</td>
<td>Max. number of air outlets per floor tile</td>
<td></td>
</tr>
<tr>
<td>- 500 mm x 500 mm</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>- 600 mm x 800 mm</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Min. air outlet centre spacing, approx. m</td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td>Min. spacing from seat to air outlet, approx. m</td>
<td>0.5</td>
<td></td>
</tr>
</tbody>
</table>

1) PC = polycarbonate; Al = aluminium; St = galv. sheet metal
2) Other material on request
3) Powder coating on request
4) With reference to a vertical load applied onto the outlet centre, over 50 mm diameter

**Technical layout to DS 4074**
Adjustable floor outlet
Type BA-V-DN 150

The air outlet element is fitted with 12 outer slots and 6 inner slots as well as an adjustment disc at its bottom. The adjustment disc enables to change the discharge pattern from "floor twist outlet" type to "floor displacement outlet" type and vice versa.

If the adjustment disc is in top position, all inner slots are closed. The outlet operates as a floor twist outlet for turbulent mixing air flow, with vertical upflow.

If the adjustment disc is in bottom position, the supply air is discharged through all of the slots. Thanks to the special shape of the slots, the air jets are deflected to horizontal. The outlet then operates as a floor displacement outlet.

The outlet is installed in the floor according to Fig. 6 + 7 (page 3).

Features:
- Operates as a floor twist outlet or floor displacement outlet
- For raised floors, for installation in a stepped bore or - with clamp insert - in a through bore of the floor tile
- Twist element and clamp insert made of plastic
- Suitable for connection to a "pressurized plenum" system or - with connection box - to a "duct connection" system
- With distributor basket for even air supply, with or without throttle device for volume flow rate adjustment, type options VS, VSD, VK (Fig. 10-11)

---

### Technical data

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>DN 150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air volume flow rate</td>
<td>l/s m³/h</td>
</tr>
<tr>
<td>5.5 – 14</td>
<td>20 – 50</td>
</tr>
</tbody>
</table>

#### Operation as

- **Floor twist outlet**
  - Max. temperature difference supply air-return air: K ± 10
  - Supply air temperature: °C 18 – 30

- **Floor displacement outlet**
  - Max. temperature difference supply air-indoor air: K – 1 to – 4
  - Supply air temperature: °C ≥ 20
  - Coverage radius: m 4 – 5

<table>
<thead>
<tr>
<th>Material</th>
<th>PC</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Air outlet element</td>
<td></td>
</tr>
<tr>
<td>- Distributor basket</td>
<td></td>
</tr>
<tr>
<td>- Clamp insert</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min. spacing from seat to air outlet</th>
<th>m</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. load-bearing capacity</th>
<th>kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td></td>
</tr>
</tbody>
</table>

---

1. At head level of seated person
2. PC = polycarbonate
3. With reference to a vertical load applied onto the outlet centre, over 50 mm diameter

Technical layout to DS 4047
NTK floor twist outlet
Type DB-N-DN 215

Outlet designed for installation in floor plenums. The supply air is discharged upwards by the twist element fitted with a number of inclined slots arranged radially on its periphery. The circular outlet centre has a recess for insertion of carpeting.

**Features:**
- Slim vertical jet with intensive admixture of indoor air
- For low-height floor plenums, for installation in a floor opening
- Twist element and floor insert made of plastic
- For connection to a "pressurized plenum" system
- Floor insert fitted with perforated throttle disc of type D (Fig. 33-34) easy to adjust during system tuning
- Central recess for insertion of carpeting; as an option, recess fitted with lid

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>DN 215</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air volume flow rate</td>
<td>l/s</td>
</tr>
<tr>
<td>8.5 – 16.5</td>
<td>30 – 60</td>
</tr>
<tr>
<td>Max. temperature difference</td>
<td>K</td>
</tr>
<tr>
<td>Supply air temperature</td>
<td>°C</td>
</tr>
<tr>
<td>Material</td>
<td>PC</td>
</tr>
<tr>
<td>Mounting diameter</td>
<td>mm</td>
</tr>
<tr>
<td>Min. air outlet centre spacing, approx.</td>
<td>m</td>
</tr>
<tr>
<td>Min. spacing from seat to air outlet, approx.</td>
<td>m</td>
</tr>
<tr>
<td>Max. load-bearing capacity</td>
<td>kg</td>
</tr>
</tbody>
</table>

1) At head level of seated person
2) PC = polycarbonate
3) With reference to a vertical load applied onto the outlet centre, over 50 mm diameter

**Technical layout to DS 1277**
Floor outlets for displacement ventilation

Principle of displacement ventilation

In displacement ventilation, the supply air is discharged at low turbulence at 1 to 4 K under the room air temperature. The cooler supply air flows downwards to the floor and spreads horizontally, in circles, creating a thin layer of cool air. Following the buoyancy forces generated by occupants, electrical equipment, etc., the air moves upwards, at very low velocity, through the occupied zone to the ceiling area where it is exhausted as warm, contaminated air (Fig. 39).

Floor displacement outlet

Type Q-B-DN 200

The air outlet element has slots arranged like a star as well as perforations in its centre. Thanks to the special shape of the slots, the air jets are deflected to horizontal.

Features:
- Radial, horizontal jet dispersion
- For raised floors, for installation in a stepped bore or - with clamp insert - in a through bore of the floor tile
- Twist element and clamp insert made of aluminium
- Suitable for connection to a “pressurized plenum” system or - with connection box - to a “duct connection” system
- With distributor basket for even air supply, with or without throttle device for volume flow rate adjustment, type options VS, VSD, VK, VN, VND, VPD (Fig. 10-13)

Technical layout to DS 4062

As supplied for:
- Union Krankenversicherung AG, Saarbrücken / D;
- Congress Center Messe Frankfurt, Frankfurt am Main / D

Nominal diameter

<table>
<thead>
<tr>
<th>DN 200</th>
<th>Nominal diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN 200</td>
<td>≤ 100 m³/h</td>
</tr>
<tr>
<td>DN 200</td>
<td>≤ 28 l/s</td>
</tr>
</tbody>
</table>

Max. temperature difference

<table>
<thead>
<tr>
<th>air – indoor air</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 4 – 5</td>
<td>≥ 20</td>
</tr>
</tbody>
</table>

Supply air temperature

<table>
<thead>
<tr>
<th>°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 20</td>
</tr>
</tbody>
</table>

Coverage radius

<table>
<thead>
<tr>
<th>m</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 – 5</td>
</tr>
</tbody>
</table>

Material: Air outlet element: PC or St; Distributor basket: PC or St; Clamp insert: Al

Min. spacing from seat to air outlet

<table>
<thead>
<tr>
<th>m</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.8</td>
</tr>
</tbody>
</table>

Max. load-bearing capacity

<table>
<thead>
<tr>
<th>kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 500</td>
</tr>
</tbody>
</table>

1) At head level of seated person
2) PC = polycarbonate; Al = aluminium; St = galv. sheet metal
3) With powder coating on request
4) With reference to a vertical load applied onto the outlet centre, over 50 mm diameter

Air jet pattern of Q-B-DN 200
Floor displacement outlet
Type Q-B-DN 215

The supply air is discharged by a number of radial slots arranged on the periphery of the outlet element. Since the slot outer edges are inclined at alternate angles to horizontal, the supply air jets are more or less broadly spread and their velocity reduced accordingly.

Features:
- Radial, horizontal jet dispersion
- For low-height floor plenums, for installation in a floor opening
- Twist element and floor insert made of plastic
- For connection to a "pressurized plenum" system
- Floor insert fitted with perforated throttle disc of type D (Fig. 45)
- Central recess for insertion of carpeting; as an option, recess fitted with lid

Q-B-DN 215 prior to installation
Floor insert with throttle device of type D, and floor plenum with opening

Q-B-DN 215 installed in floor plenum

Technical layout to DS 4007

Table: Q-B-DN 215

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>DN 215</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air volume flow rate l/s</td>
<td>≤ 14</td>
</tr>
<tr>
<td>≤ 50</td>
<td></td>
</tr>
<tr>
<td>Max. temperature difference supply air–indoor air</td>
<td>K</td>
</tr>
<tr>
<td>–1 to –4</td>
<td></td>
</tr>
<tr>
<td>Supply air temperature °C</td>
<td>≥ 20</td>
</tr>
<tr>
<td>Coverage radius m</td>
<td>4 – 5</td>
</tr>
<tr>
<td>Material PC</td>
<td></td>
</tr>
<tr>
<td>Mounting diameter mm</td>
<td>214</td>
</tr>
<tr>
<td>Min. spacing from seat to air outlet m</td>
<td>1</td>
</tr>
<tr>
<td>Max. load-bearing capacity</td>
<td>kg</td>
</tr>
<tr>
<td>1) At head level of seated person</td>
<td></td>
</tr>
<tr>
<td>2) PC = polycarbonate</td>
<td></td>
</tr>
<tr>
<td>3) With reference to a vertical load applied onto the outlet centre, over 50 mm diameter</td>
<td></td>
</tr>
</tbody>
</table>

Q-B-DN 215 in an open-plan office of the Bayerische Vereinsbank, Frankfurt/Main / D

Q-B-DN 215 in a meeting room at Lotto Rheinland-Pfalz, Koblenz / D
Customized floor air outlets

The challenge here was to skilfully fit the outlets into the marble tiles and to match up the outlet colour with the tile colour.

Floor twist outlet of type DB-E-DN 200 in the marble floor of the multi-purpose room of the Oesterreichische Kontrollbank AG, Vienna / A

Floor twist outlet of type DB-EA-DN 150 at “Holland Casino”, Utrecht / NL

Floor twist outlet of type DB-EA-DN 200 in the church of Oecumenische Basisgemeente De Duif, Amsterdam / NL

Fig. 54: Crosstalk silencer for reducing sound transmission from room to room where there is a common raised floor.

For installation under the distributor basket and fastening to the floor tile.

Available for air outlets to be installed in raised floors with adequate plenum height.

Details on dimensions and insertion loss on request.

Crosstalk silencer
You will find full details of our agencies at www.krantz.de

Sales agents in
Germany

Krantz GmbH
Uersfeld 24, 52072 Aachen, Germany
Phone: +49 241 441-1, Fax: +49 241 441-555
info@krantz.de, www.krantz.de

- Aachen
- Dresden
- Frankfurt Dreieich
- Hamburg
- Munich
- Stuttgart

Agencies worldwide
Europe

- Austria
- Belgium
- Cyprus
- Denmark
- Finland
- France
- Greece
- Great Britain
- Iceland
- Ireland

- Italy
- Netherlands
- Norway
- Poland
- Portugal
- Russia
- Spain
- Switzerland
- Turkey

Africa

- South Africa

Asia

- Canada
- Mexico
- United States of America

America

- Bahrain
- China
- China - Hong Kong
- Japan
- Kuwait
- Qatar
- Singapore
- South Korea
- Taiwan
- Thailand
- United Arab Emirates

Oceania

- Australia
- New Zealand