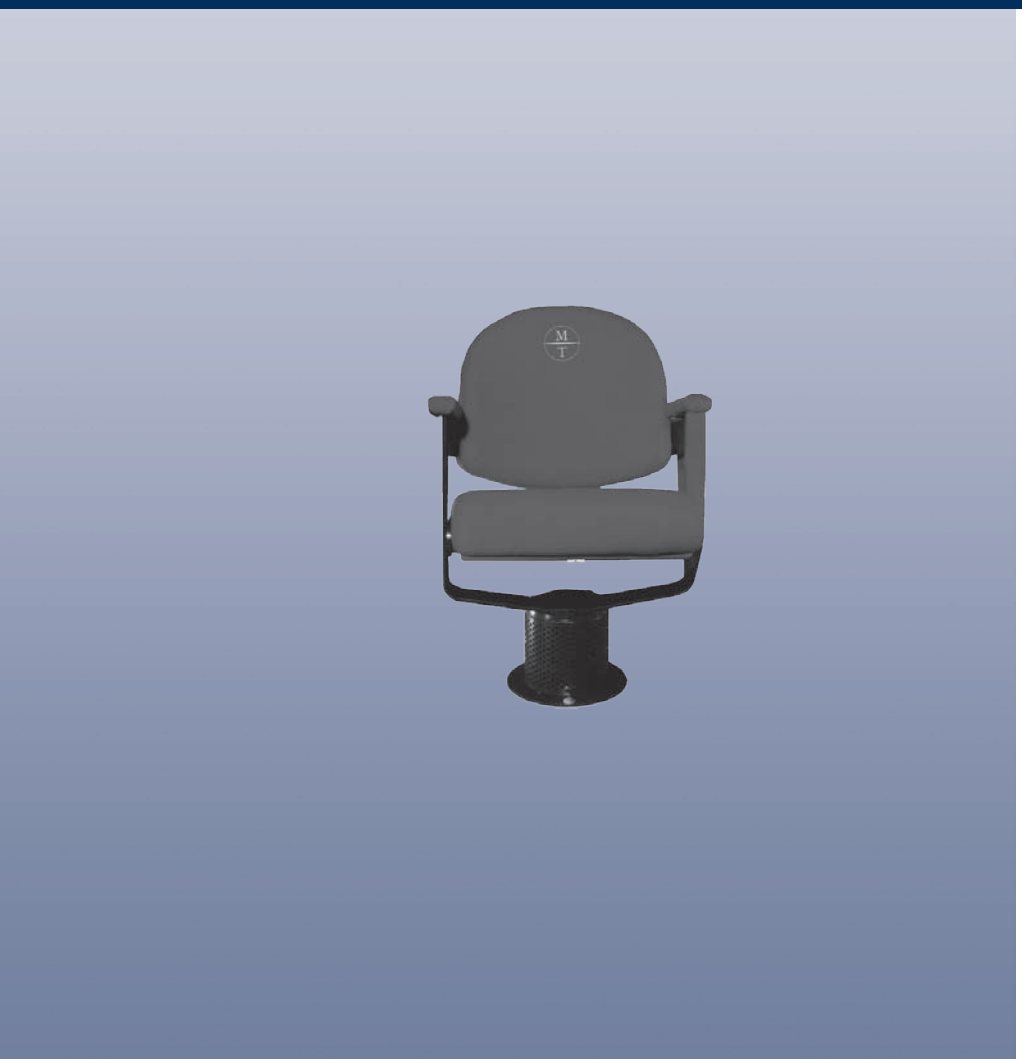

Seat displacement outlet Q-ST....

DS 4028 E 05.2010

Seat displacement outlet

Preliminary remarks

Seat displacement outlets are used to supply air to rooms with fixed seating, such as auditoriums, congress halls, theatres, etc. They operate according to the displacement ventilation principle and are integrated into the seat leg.

Construction

The upper part of the cylindrical seat leg **1** is designed in the form of a perforated metal cylinder **2**. It contains the air distributor **3** and at the intake, in the lower part, a fixed throttle **4**. The type of fastening depends on the thickness and material of the floor. The type of flange **5** and screw fitting **6** is determined according to customer's requirements.

The seat displacement outlet is available in the sizes DN 100, DN 127 and DN 190.

Key

1 Seat leg with displacement outlet
2 Perforated metal cylinder
3 Air distributor
4 Fixed throttle
5 Flange
6 Screw fitting
7 Thin floor (e.g. wood)
8 Thick floor (e.g. concrete)
9 Pressurized plenum
10 Supply air

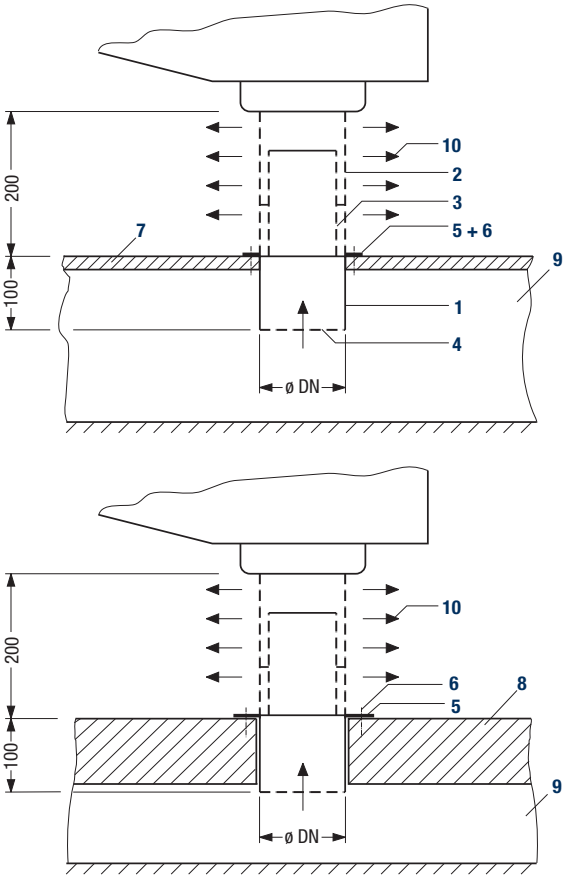

Figure 1: **Construction and main dimensions**
Above: **Connection to raised floor (e.g. wood)**
Below: **Connection to concrete floor**

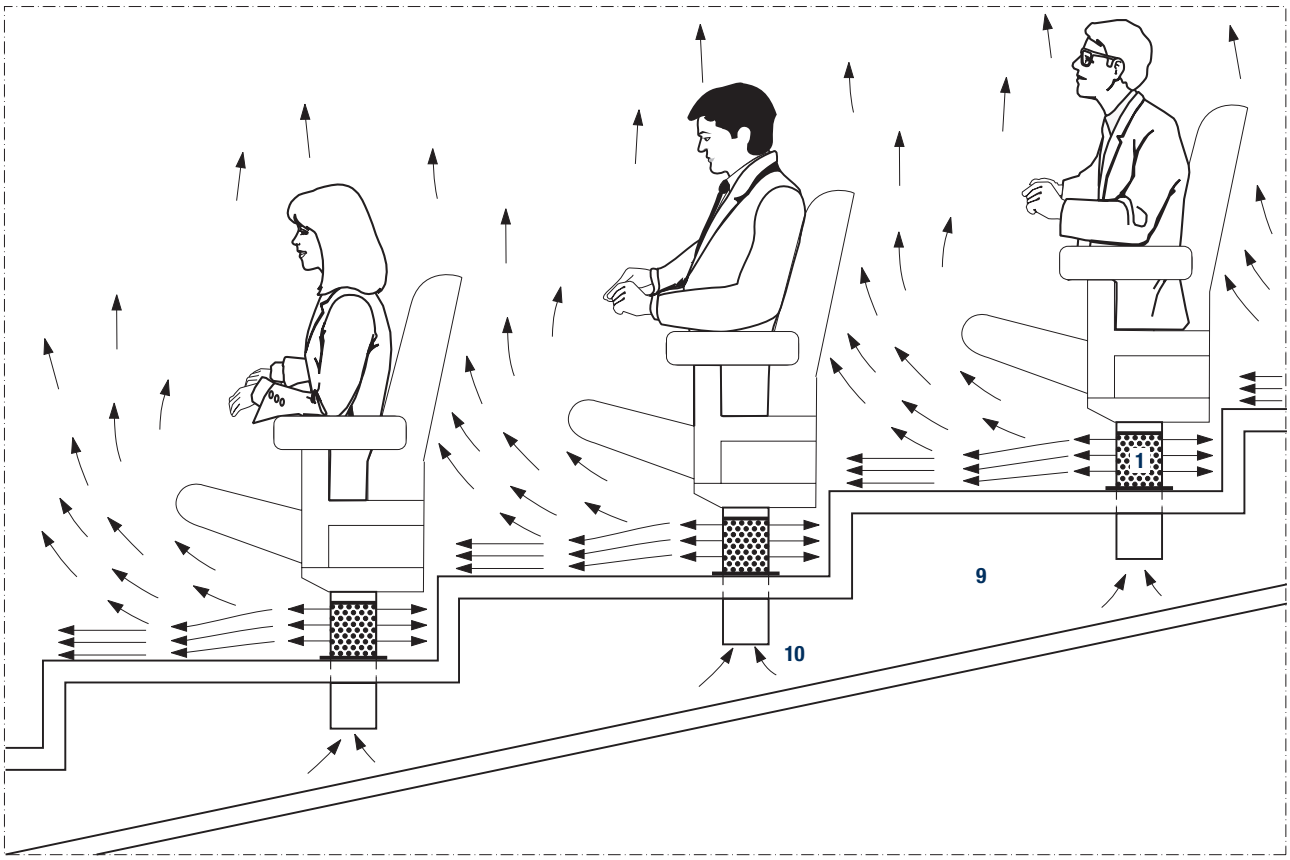

Figure 2: **Air flow pattern with seat displacement outlets**

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Seat displacement outlet

Figure 3: Seat displacement outlet, photograph

Mode of operation

The supply air flows from the floor plenum (pressurized plenum **9**) via the fixed throttle **4** into the outlet. The fixed throttle **4** ensures an equal supply to all the seat displacement outlets connected to the pressurized plenum. Thanks to the air distributor **3** an even radial air flow enters the perforated metal cylinder **2** and is discharged at low turbulence and momentum in all directions. At low velocity the supply air flows in a thin layer along the floor and rises, due to buoyancy, to the seated person's breathing zone.

Figure 4 shows the air velocities in the near-zone of the outlet for size DN 127 and supply air volume flow rate $\dot{V}$ = 11 l/s [40 m³/h]. The distance between the central axes of two outlets is 550 mm, in line with the possible minimum distance between seats. At greater distances, the air velocities are even lower.
At over 500 mm above the floor, the air velocity drops to ≤ 0.1 m/s.

Figure 4 also shows the vertical increase in air temperature. Owing to the buoyancy flow at the seated persons, the rising air develops a vertical temperature gradient which can reach up to 2 K/m, depending on the room height and the cooling load. The return air temperature under the ceiling is therefore much higher than the room temperature in the breathing zone of the seated people. The heat load of the occupants and lighting can thus be effectively removed even at small temperature differences between supply air and indoor air ($\Delta\vartheta \leq -4$ K).

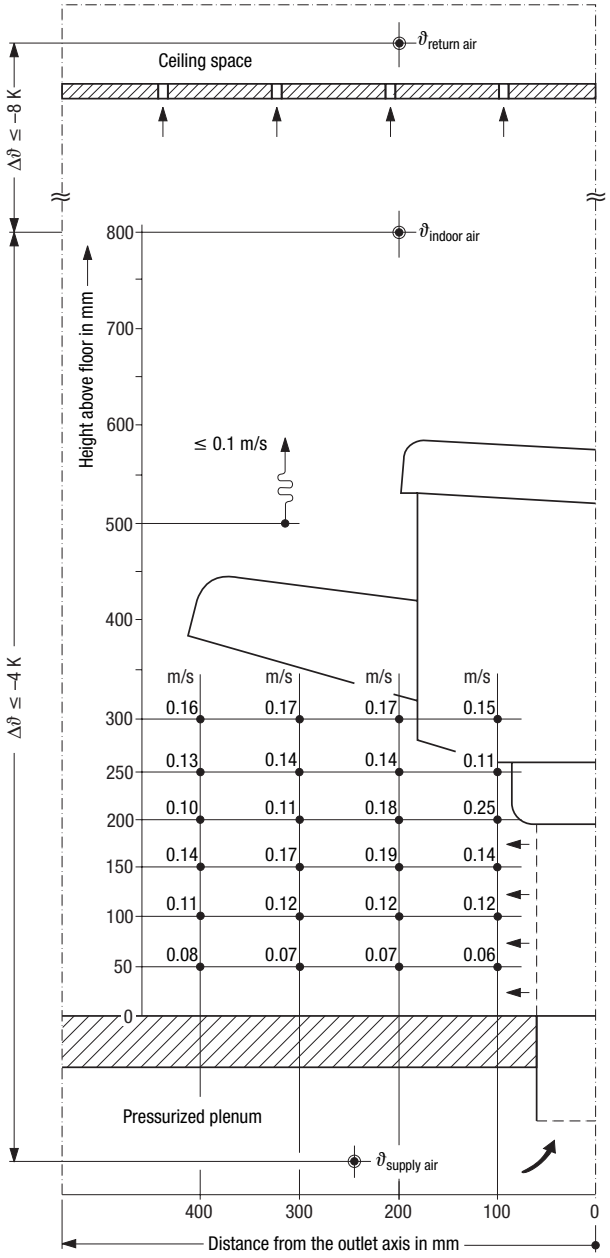
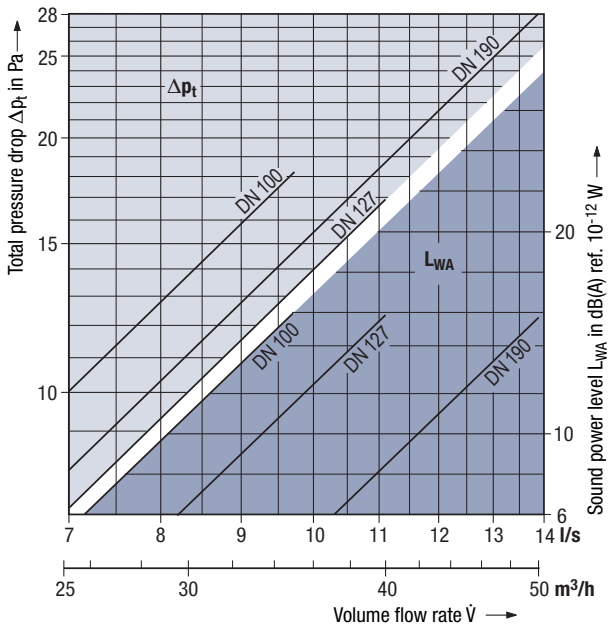


Figure 4: Example of air velocities around the feet and legs of the seated person and vertical temperature differences; size DN 127; supply air volume flow rate $\dot{V}$ = 11 l/s [40 m³/h]

Seat displacement outlet

Sound power level and pressure drop



Layout data

Size		DN 100	DN 127	DN 190
Supply air volume flow rate $\dot{V}_{max}$	l/s	10	11	14
	m³/h	35	40	50
Air outlet height	mm	200		
Discharge velocity	m/s	≤ 0.16		
Supply air temperature	°C	≥ 20		
Temperature difference supply air–indoor air [1]	K	≤ –4		
Temperature difference supply air–return air	K	≤ –12		

Features

- Air distribution system for auditoriums, congress halls, theatres and other assembly rooms with fixed seating
- Integrated into the seat leg
- Low-turbulence horizontal, radial jet distribution over the floor
- Draught-free fresh air supply to the occupied zone
- Connection to the pressurized plenum
- Very low sound power level (L_{WA} ≤ 16 dB(A) ref. 10^{-12} W)
- Available in three sizes
- Outlet volume flow rate up to 14 l/s [50 m³/h]
- Temperature difference between supply air and indoor air up to –4 K and between supply air and return air up to –12 K, depending on the room height and cooling load

Type code

Q-ST – DN ___ – ___ – __

Seat displacement outlet | Size | Surface finish | Fastening

Size

100 = DN 100
127 = DN 127
190 = DN 190

Surface finish

9005 = face painted to RAL 9005, matt
.... = face painted to RAL .... [2]

Fastening

F = connection flange

Tender text

..... units
Seat displacement outlet, integrated into a seat leg, for draught-free fresh air supply to the occupied zone,

consisting of:
- a perforated metal cylinder (seat leg) with fixed throttle at the intake side for equal air supply to all seat displacement outlets connected to a pressurized plenum
- a built-in air distributor for equal air supply to the perforated metal cylinder

Floor connection with flange

Material:
- Seat leg made of sheet metal
- Air distributor made of galvanized sheet metal
- All visible parts powder coated to RAL ....

Make: KRANTZ KOMPONENTEN
Type: Q-ST – DN ___ – ___ – __

Subject to technical alterations.

[1] At head height of seated person
[2] Other colours on request

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