

Rectangular floor displacement outlet Q-BR....

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Preliminary remark

The rectangular floor displacement outlet is designed to deliver supply air to commercial rooms with raised floors or floor plenums. It is placed on the concrete slab and is level with the raised floor.

Mode of operation

The air outlet generates a combined mixing/displacement flow or hybrid flow as described in the German guideline VDI 3804 (see Fig. 3). The advantages of this hybrid flow against a mere displacement flow are low air velocities and a low vertical temperature gradient.

The supply air is discharged through the floor grille close to the facade. It first streams vertically and mixes, in the cooling mode, with the warm indoor air in front of the facade; then a displacement flow forms, which spreads in the room at floor level.

The buoyancy forces in the room (generated by occupants, electrical equipment, etc.) produce displacement flows with very low velocities from the floor to the ceiling. The warm, stale indoor air is extracted at ceiling level.

Construction design

The rectangular floor displacement outlet consists of the housing **1** with two supply air connections **2**, the grille with support frame **3** and the perforated air distribution plate **5** (non-adjustable) which creates the combined mixing/displacement flow. To make up for constructional tolerances the air outlet is fitted with threaded screws **4** which are adjustable in height. The housing walls are bevelled to receive the walkable grille.



Fig. 1: Rectangular floor displacement outlet in front of a facade

Layout specifications

Supply air volume flow rate	l/(s·m)	up to 55
	m ³ /(h·m)	up to 200
Temperature difference supply air to indoor air	K	-1 to -6

The outlet dimensions are adapted to the space available on the projects concerned.

The supply air coverage is up to 6 m from the air outlet. For larger coverage, provision should be made for two air outlets or two air outlet rows on opposite sides of the room.

Permissible load for rectangular floor displacement outlet with grille:

- walkable grille: 1.5 kN point load at the most unfavourable point on a 200x200 mm load application area.
- uniformly distributed load: 3.0 kN/m².

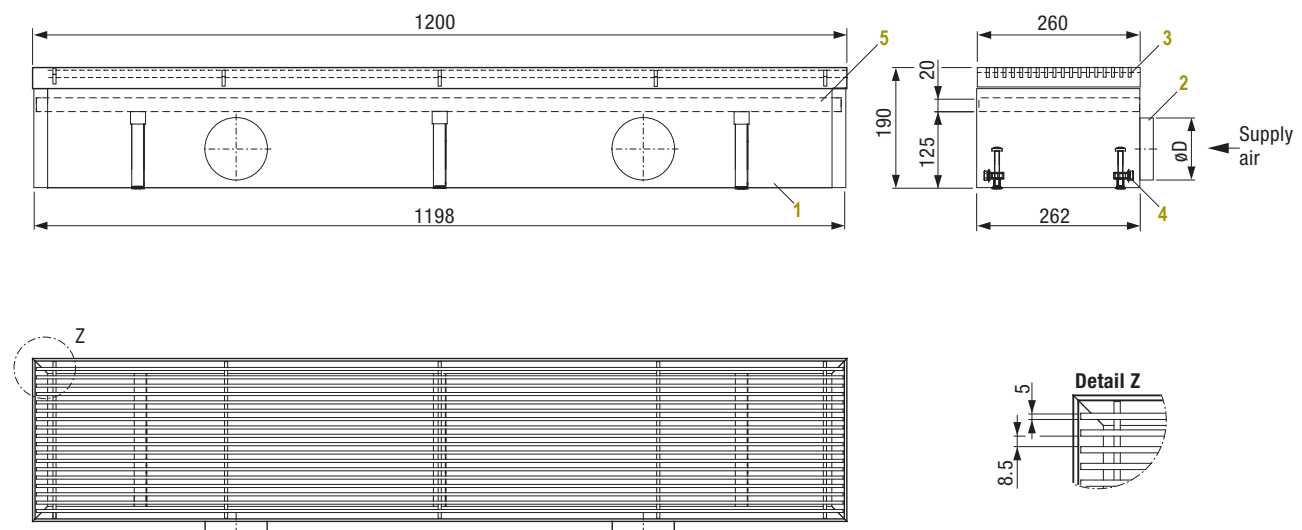


Fig. 2: Standard dimensions of rectangular floor displacement outlet

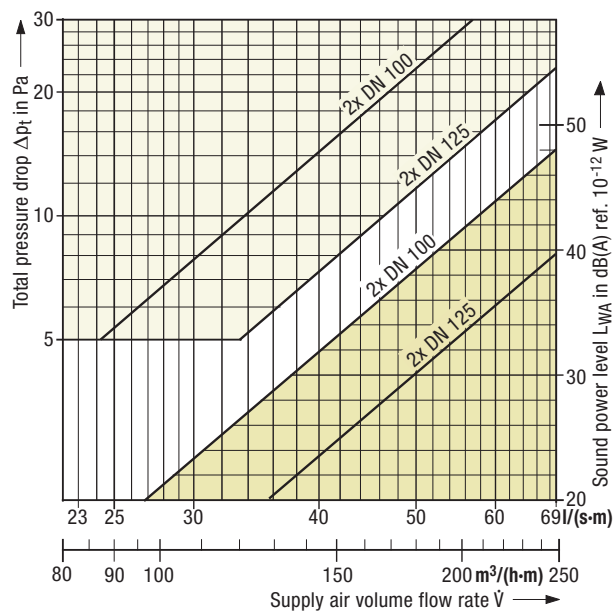
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Fig. 3: Air flow pattern

Sound power level and pressure drop

Sound power level and pressure drop mainly depend on the air volume flow rate and the air velocity both in the connection spigots and at the air distribution plate.



Graph: Sound power level and pressure drop

Diameter of the 2 connection spigots	Specific air volume flow rate \dot{V}_{sp}		Sound power level L_{WA} dB(A) ref. 10^{-12} W	Total pressure drop Δp_t Pa
	$l/(s \cdot m)$	$m^3/(h \cdot m)$		
DN 100	28	100	21	7
	42	150	33	16
DN 125	42	150	25	8
	56	200	33	14

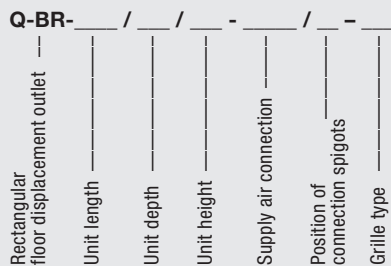
Table: Supply air connection sizing

Main features

- Combined mixing/displacement flow or hybrid flow as described in German VDI 3804 guideline
- For mounting in raised floors
- Air volume flow rate up to 55 $l/(s \cdot m)$ [200 $m^3/(h \cdot m)$], one-way or two-way discharge
- Draught-free indoor air flow with very low air velocities in the occupied zone
- Large supply air coverage (up to 6 m)

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Type code



Unit length ¹⁾

- 800 = length 800 mm
- 1000 = length 1,000 mm
- 1200 = length 1,200 mm (standard)
- 1450 = length 1,450 mm
- 1700 = length 1,700 mm
- 1900 = length 1,900 mm

Unit depth ¹⁾

- 140 = depth 140 mm
- 180 = depth 180 mm
- 260 = depth 260 mm (standard)
- 340 = depth 340 mm

Unit height ¹⁾

- 190 = height 190 mm (standard)
- 130 = height 130 mm (supply air connection at the bottom)

Supply air connection

- 100 = 2x DN 100
- 125 = 2x DN 125

Position of connection spigots

- 1 = at the front (room side)
- 2 = at the bottom

Grille type (made of aluminium)

- L = linear bar grille
- Q = crossbar grille
- R = roll-up grille

Tender text

..... units

Rectangular floor displacement outlet generating a combined mixing/displacement flow or hybrid flow as described in German VDI 3804 guideline, for mounting in a raised floor,

consisting of:

- a housing with two supply air connections; the housing walls are bevelled to receive the walkable grille; to make up for constructional tolerances the air outlet is fitted with threaded screws that are adjustable in height;
- a perforated air distribution plate (non-adjustable) which creates the hybrid flow;
- a linear bar grille, stiff and walkable (optional designs: crossbar grille, roll-up grille), bar dimensions: 16 x 5 mm, bar spacing: 8.5 mm. The support frame is fixed to the outlet housing by means of turnable clips.

Material:

- Housing made of galvanized sheet metal painted to RAL 7024 (graphite grey), matt
- Grille and support frame made of aluminium anodized in natural colour (other anodization colours or RAL colour finishes on request).

Make:

KRANTZ KOMponentEN

Type:

Q-BR-___ / ___ / ___ - ___ / ___ - ___

Subject to technical alteration.

¹⁾ Other dimensions available on request