Indoor Environment Quality
IEQ-8 Individual Comfort Control

Points Available	Points Claimed	CIR Submitted
2	1	N
1	1	N

Credit Criteria
Up to two points are awarded where it is demonstrated that workstations enable individual control of the air supply rates, air temperature or radiant temperature to each workstation, as follows:
- 1 point where 60% of workstations enable individual control;
- 2 points where 90% of workstations enable individual control.

An additional point is awarded where the tenancy fitout works alter the existing base building's HVAC system to achieve at least one point above. Where the Credit Criteria is not achieved as a result of the tenancy fitout works this credit is 'Not Applicable' - type "na" in the 'No. of Points Achieved' column.

Documents Provided

✓	A brief description of the system and how it enables individual control. IEQ-8: 1
✓	As-built mechanical fitout drawings that show the location of individually controllable points and their relation to the workstations. IEQ-8: 2
✓	An extract from the tenancy fitout commissioning report that demonstrates that the individual controls are operating correctly. IEQ-8: 3 (pg 3)

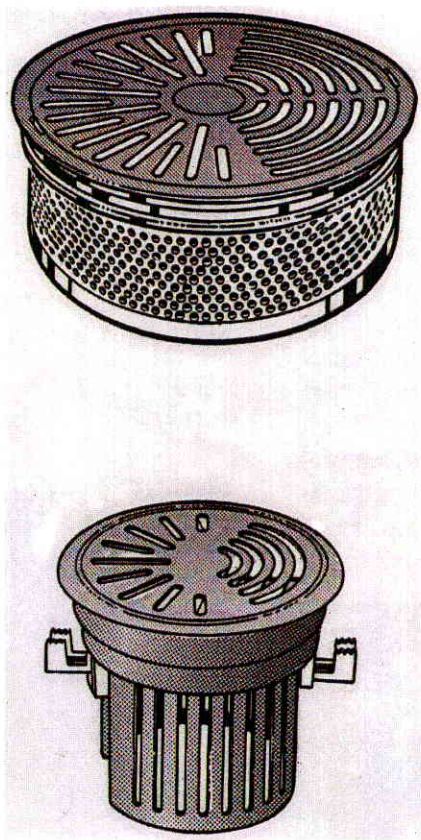
✓	An extract from the contract between the tenant and the contractor that includes the HVAC alteration scope of works. IEQ-8: 4
✓	Information from the sub-contractor that confirms that the said works were undertaken. IEQ-8: 5

Discussion
- While the commissioning report shows actual air rates provided to be lower than design air rates from the diffuser, this results from the commissioning taking place when air filters were dirty. The air filters will be replaced and raised floor diffusers re-commissioned. However, I note that this does not impact upon either this credit, as individual comfort control is established, nor on IEQ-1 Ventilation Rates, as compliant total outside air provision to the AHU is shown through commissioning reports in that credit.
- Krantz rotary twist ventilation outlets are provided at each workstation located on the raised floor. These can turned to direct air towards or away from an occupant, or they can be opened and twisted shut, cutting off air supply from that vent. This is described on pg 3 of IEQ-8: 3.

- As the raised floor was retrofitted into the tenancy, we are claiming the additional point. The 'extract from the contract between the tenant and the contractor that includes the HVAC alteration scope of works' has been provided (IEQ-8: 4). Bligh Voller Nield (Architect) acted on behalf of the Client, and the HVAC scope of works was sent by Lincolne Scott (Mechanical Engineer).

1

Technical Selection



Rotary floor twist outlet DB-D-DN....

Air-conditioning components

DS 4074 E 05.2006

Krantz KOMPONENTEN ®

Applied system solutions

Rotary floor twist outlet

Construction design

Preliminary remarks

Floor twist outlets from KRANTZ KOMPONENTEN discharge supply air with a vertical jet axis from bottom up into the room. If the client wishes individual adjustment of discharged air in the near zone of the seating area, e.g. at office workplaces, this is easy to do with the rotary floor twist outlet. Its jet axis is inclined at about 30° to vertical. Jet direction can be individually adjusted by manual rotation of the twist element.

The air outlet is intended for installation in conventional raised floor systems.

Construction design

The rotary floor twist outlet consists of the circular air outlet element **1** with radial slots **1a** and circular slots **1b**. It is available in the sizes DN 125 and DN 200. It is installed with the help of a clamp insert **5** in the through bore of the raised floor. The DN 200 air outlet element can be locked against unauthorized removal. Up to 4 DN 125 air outlets and 1 DN 200 air outlet can be inserted in floor tiles measuring 500 mm x 500 mm or 600 mm x 600 mm.

Figure 1: Rotary floor twist outlet with distributor basket and clamp insert,
Left: DN 125 with rotary claw
Right: DN 200 with clamp collar

The clamp insert has a protective collar **6** on the top which functions as edging for the tile cutout around the air outlet. This option is useful for raised floors with carpeting. The clamp insert can be fastened to the floor,
- for size DN 200 with an optional clamp nut **5a**, claw fastener **5b** or clamp collar **5d**[1)].
- for size DN 125 with rotary claw **5c**.

1) For the required air outlet type (kind, size, material) or possible combination of individual components see page 9, "Types available"

Instead of using the clamp insert, the DN 200 air outlet element can also be inserted in a stepped bore **9b**.

The rotary floor twist outlet is delivered with a distributor basket **2** for even air supply.

For size **DN 200** there are different types of distributor basket to choose from (Figure 2):[1)]
- Standard type, 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 floor. This enables 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 floor air outlet made of aluminium, with Type VPD throttle device

For size **DN 125**
- Distributor insert with throttle device: Type VD

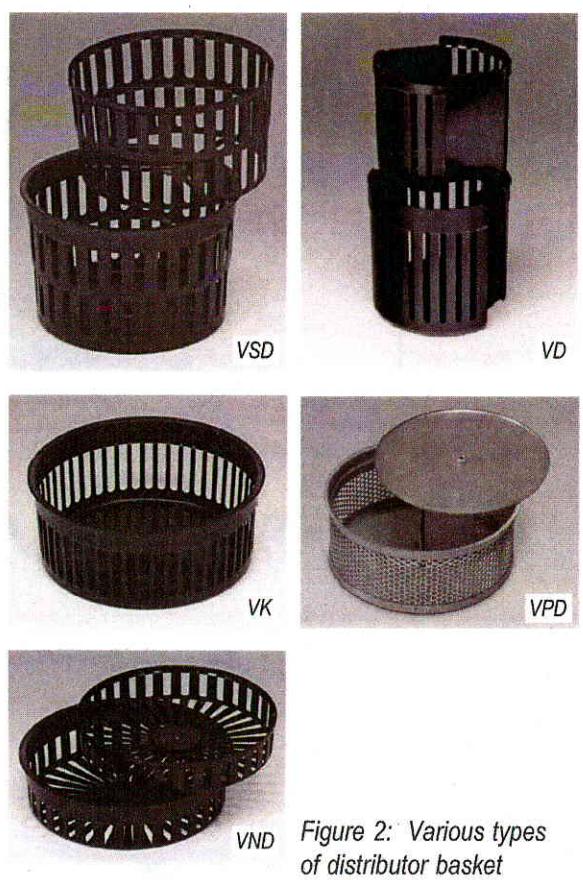


Figure 2: Various types of distributor basket

The air can be supplied directly from the pressurized plenum below the floor, with DN 200 also via a connection box with flexible tubing.

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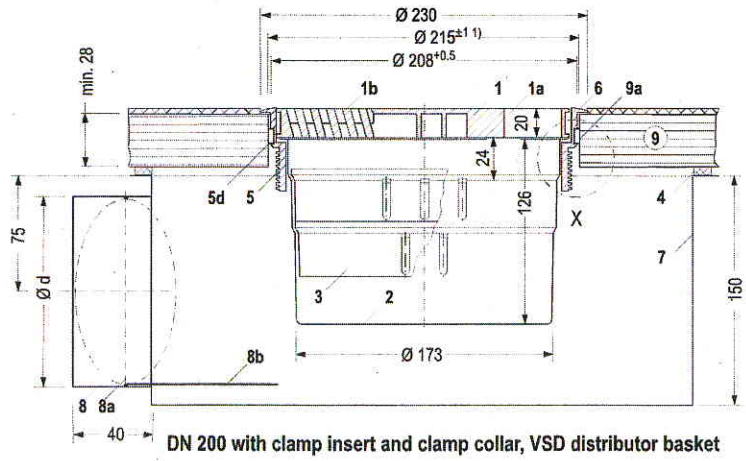
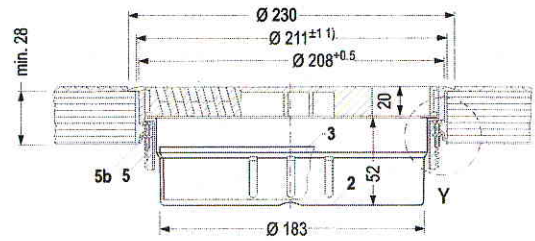
Rotary floor twist outlet made of plastic

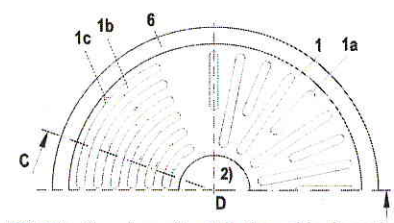
Dimensions



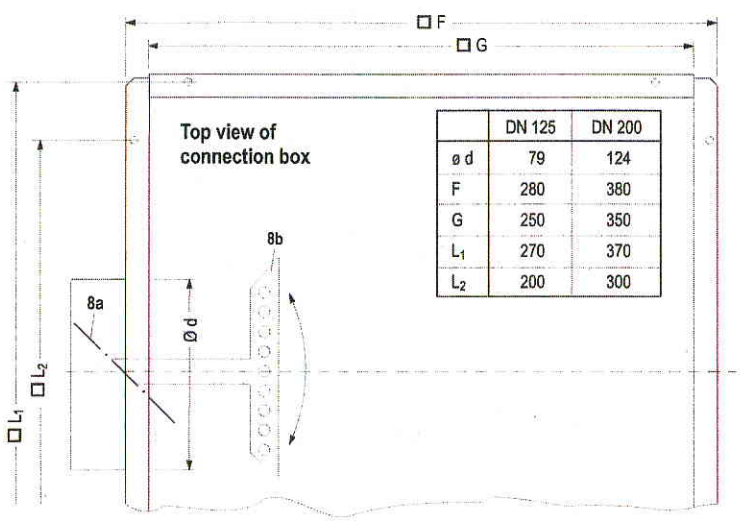
DN 200 with clamp insert and clamp collar, VSD distributor basket



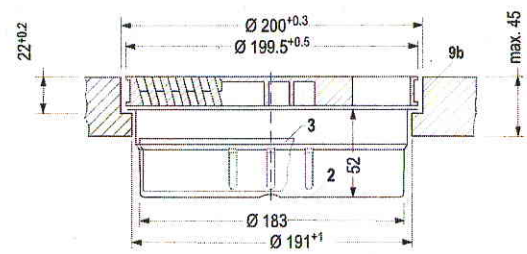
DN 200 with clamp insert and claw fastener, VND distributor basket



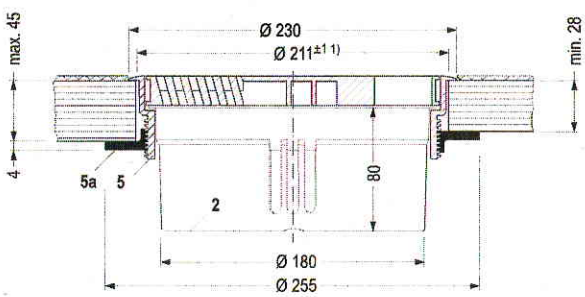
DN 200 - Top view of installation with clamp insert



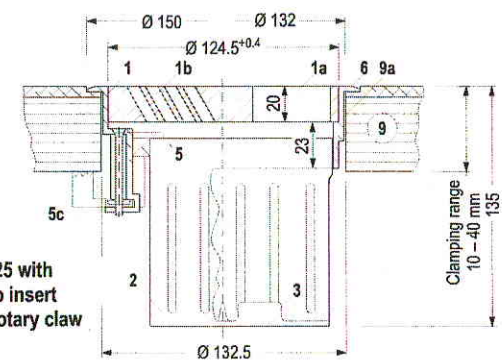
	DN 125	DN 200
ø d	79	124
F	280	380
G	250	350
L_1	270	370
L_2	200	300



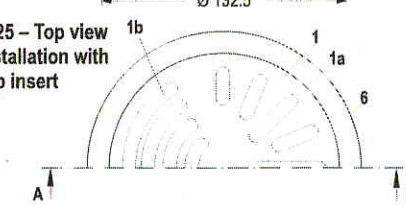
DN 200 installation in stepped bore, VND distributor basket



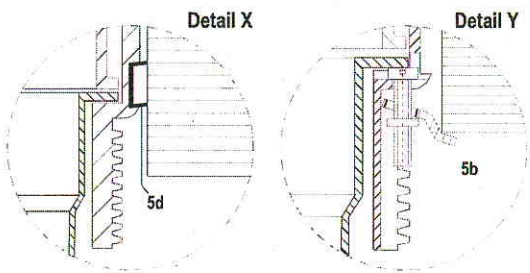
DN 200 with clamp insert and clamp nut, VK distributor basket



DN 125 with clamp insert and rotary claw



DN 125 – Top view of installation with clamp insert



Key for all pages:

1 Air outlet element	**5** Clamp insert	**8** Connection spigot
1a Radial air slots	**5a** Clamp nut	**8a** V-damper (optional)
1b Circular air slots	**5b** Claw fastener	**8b** Slide 3)
1c Marking of main jet axis	**5c** Rotary claw	**9** Floor tile
2 Distributor basket	**5d** Clamp collar	**9a** Through bore
3 Throttle device	**6** Protective collar	**9b** Stepped bore
4 Sealing (on site)	**7** Connection box	

1) Ø $211^{\pm1}$ for fastening with clamp nut or claw fastener, Ø $215^{\pm1}$ for clamp collar fastener
2) Trademark of client or other emblem on request
3) The slide **8b** is adjustable from the room

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

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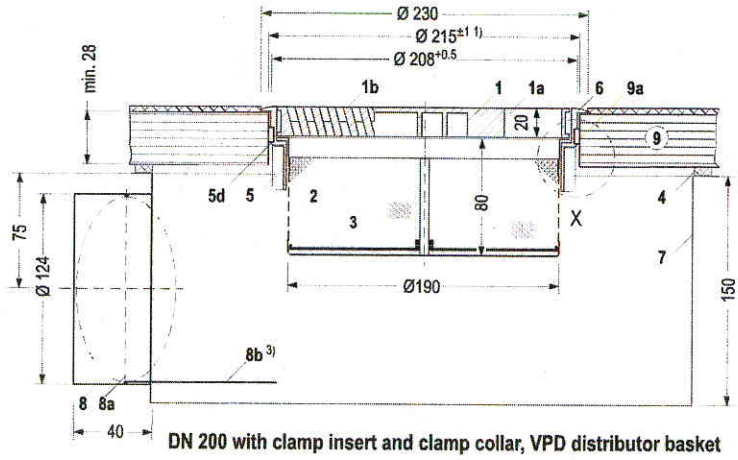
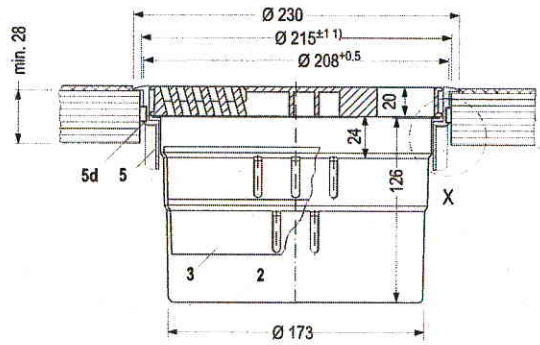
Rotary floor twist outlet made of aluminium

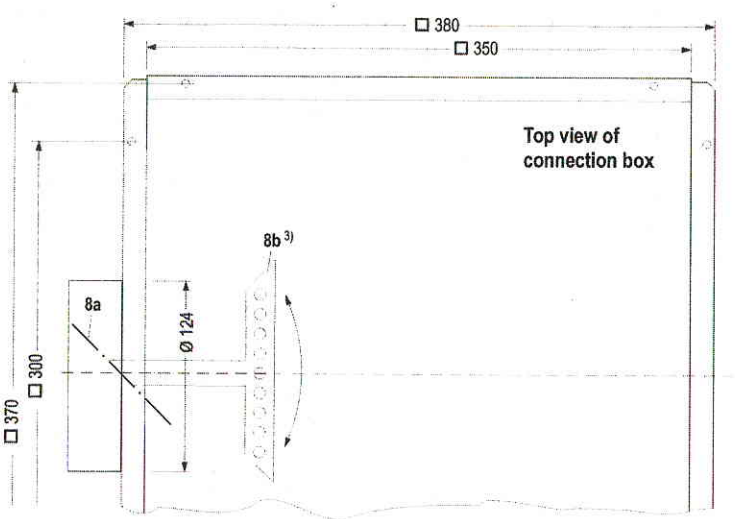
Dimensions

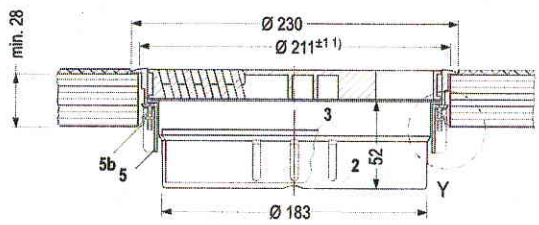


DN 200 with clamp insert and clamp collar, VPD distributor basket

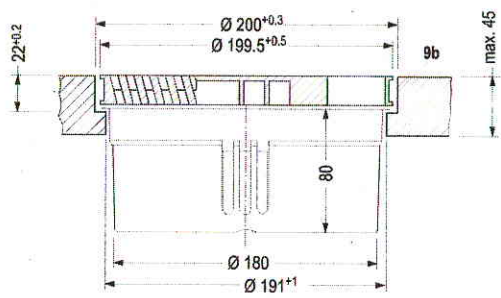


DN 200 with clamp insert and collar, VSD distributor basket



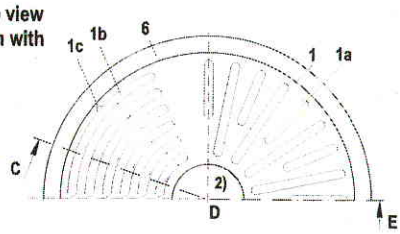


DN 200 with clamp insert and claw fastener, VND distributor basket

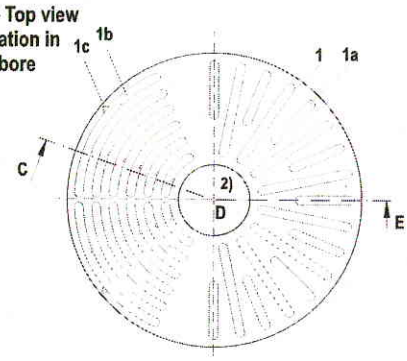


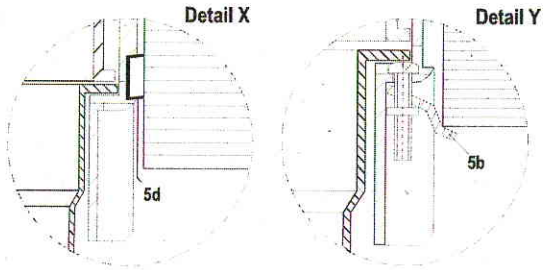
DN 200 installation in stepped bore, VK distributor basket

DN 200 – Top view of installation with clamp insert



DN 200 – Top view of installation in stepped bore





1) Ø $211^{\pm1}$ for fastening with clamp nut or claw fastener,
Ø $215^{\pm1}$ for clamp collar fastener
2) Trademark of client or other emblem on request
3) The slide **8b** is adjustable from the room

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

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Rotary floor twist outlet

Mode of operation

Mode of operation

The air slots **1a** and **1b** of the rotary floor twist outlet are inclined to vertical. The slot inclination selected and the various slot shapes result in an air jet incline of about 30° to vertical. Jet direction can be individually adjusted by manual rotation of the air outlet element.

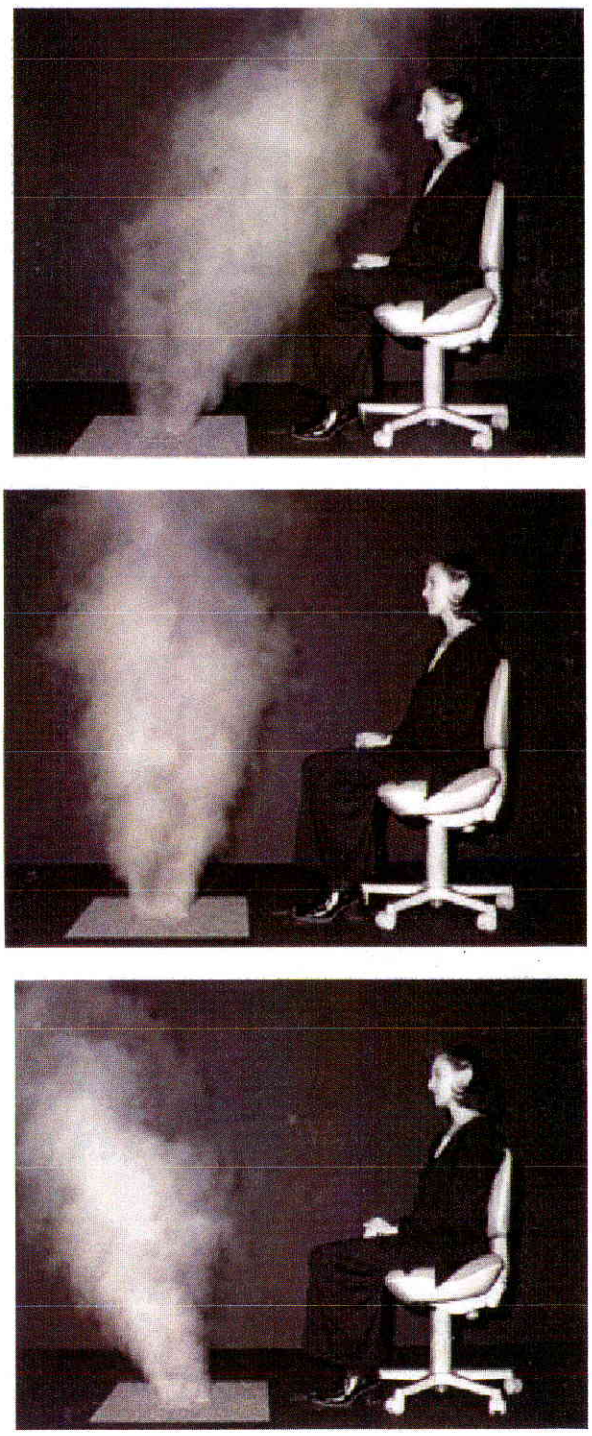

Figure 3: Jet pattern for different settings, shown for size DN 200

The rotary floor twist outlet produces high-turbulence, twisted supply air jets with intensive induction of indoor air. The heat and material loads in the room are very effectively removed with the help of buoyancy from the occupied zone to the ceiling.

A turbulent mixing air upflow is produced. Ventilation effectiveness is equivalent to that achieved with displacement ventilation. The vertical temperature gradient is, however, significantly smaller than with displacement ventilation. Even with high specific indoor cooling loads (up to 100 W/m^2), the vertical temperature gradient in the occupied zone is $\leq$ 2 K/m.

The high induction effect of the twisted supply air jets results in a rapid drop in jet velocity and fast equalization of supply air temperature and room temperature.

Due to the angle of inclination of the jet axis of about 30° to vertical, air velocities at head height near the seated person can be altered by turning the air outlet (see Figure 3)

For size DN 125:
– with 1 air outlet per floor tile
from < 0.1 m/s to about 0.3 m/s,

– with 4 air outlets per floor tile
from < 0.1 m/s to about 0.55 m/s.

For size **DN 200:**
– with 1 air outlet per floor tile
from < 0.1 m/s to about 0.4 m/s,

Air temperature can be altered by a maximum 1 K.

It is therefore possible to individually adjust the intensity of the indoor air flow in the near zone of the occupant from a fresh breeze to full draught avoidance with air velocities < 0.1 m/s.

These specifications are based on extensive measurements also taken for DN 125 in 4 rotary positions (Figure 4). Figure 6 shows the air jet patterns for these 4 rotary positions made visible using a smoke tracer.

For rotary position 1 and 4, for example, the air velocity curves are shown in Figure 5.

For size DN 200 (1 air outlet per floor tile) Figure 7 shows the velocity curve in the main jet axis. The main jet direction is indicated by a marking on the surface of the air outlet.

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Rotary floor twist outlet

Air velocities

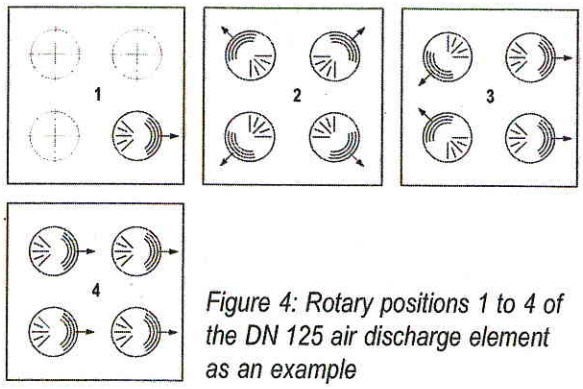


Figure 4: Rotary positions 1 to 4 of the DN 125 air discharge element as an example

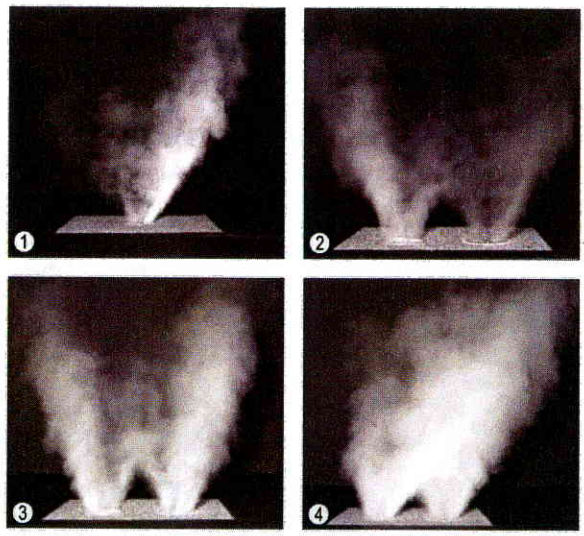
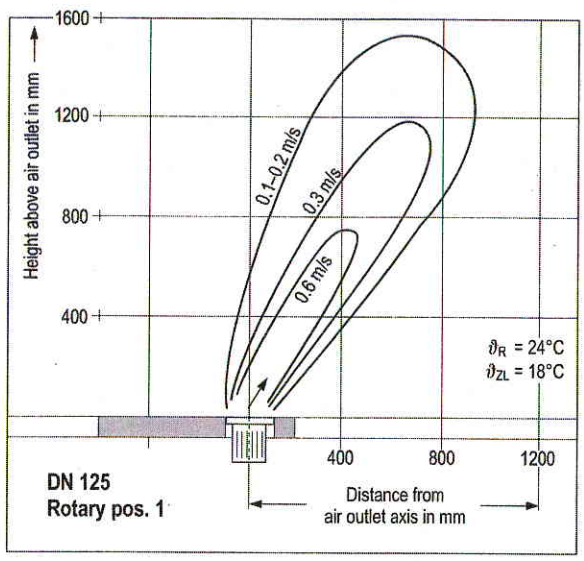
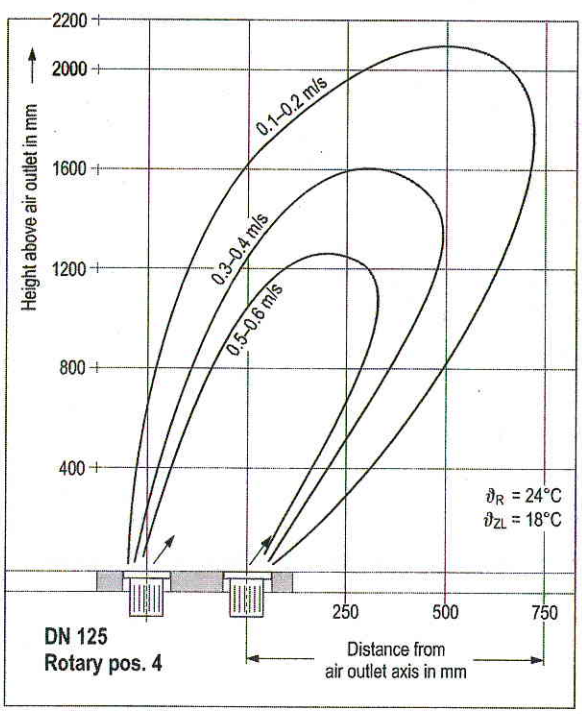


Figure 6: Air jet patterns for rotary positions 1 to 4 made visible with a smoke tracer





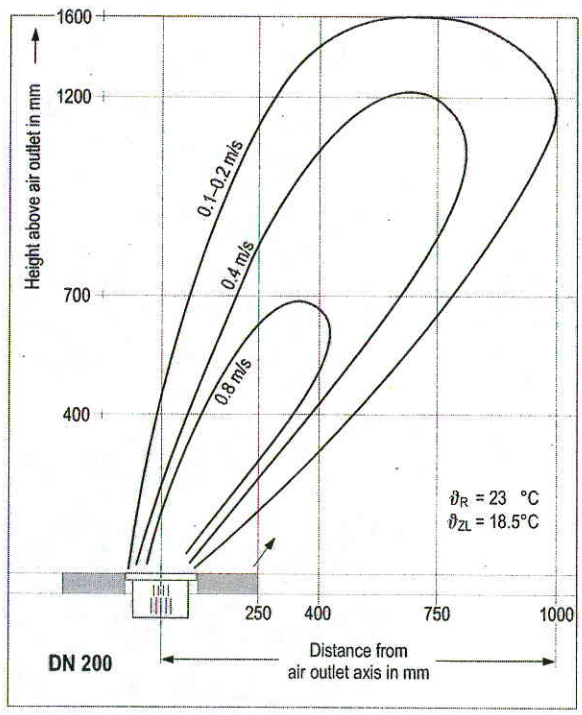


Figure 7: Air velocities for DN 200 in the main jet axis, volume flow rate 42 l/s (150 m³/h)

⇐

Figure 5: Jet velocity curve for DN 125, rotary position 1 and 4, volume flow rate 14 l/s (50 m³/h) per air outlet

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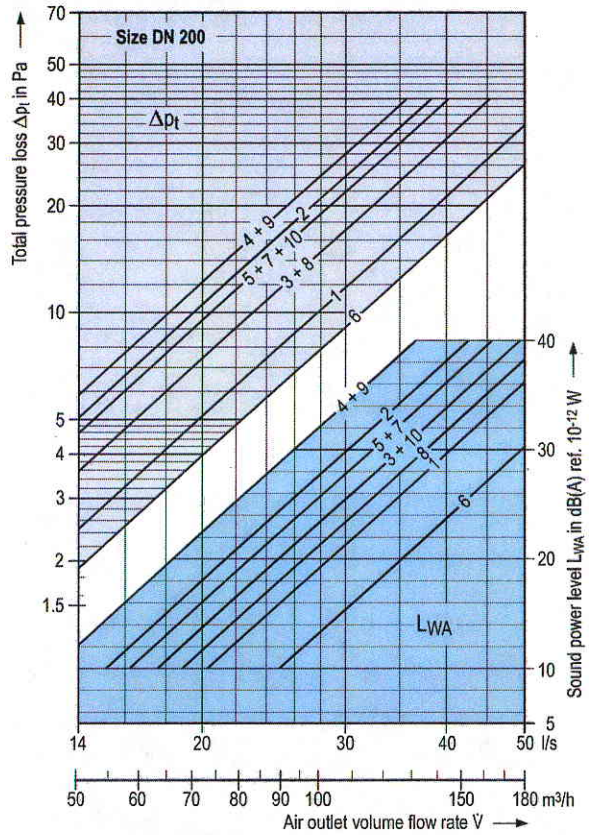
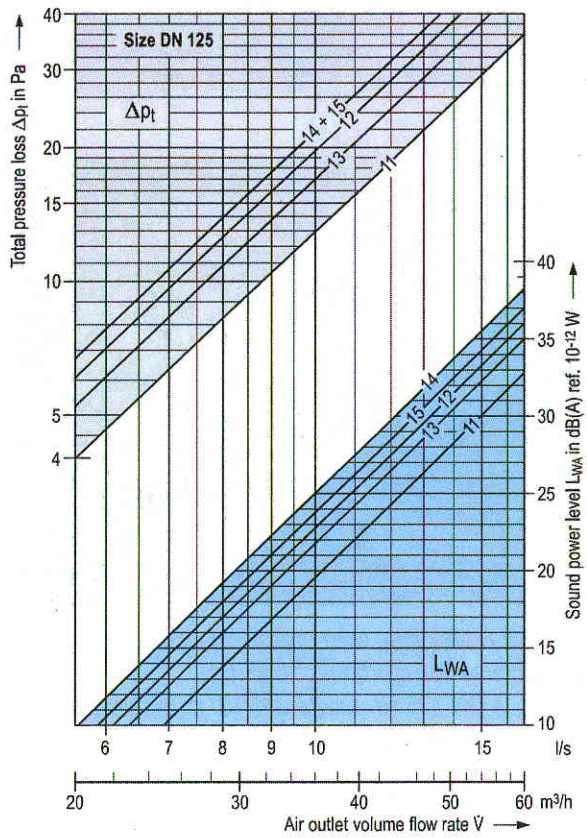
Rotary floor twist outlet

Layout specifications

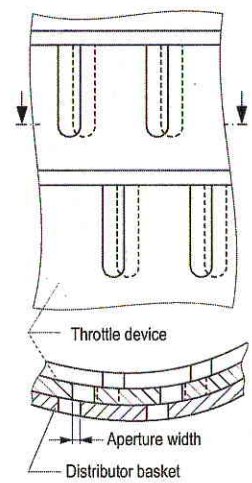
Sound power level and pressure loss [1]



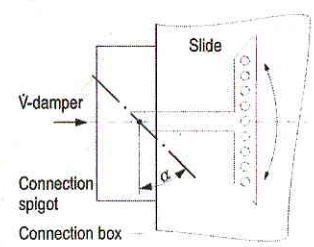


Key to graphs

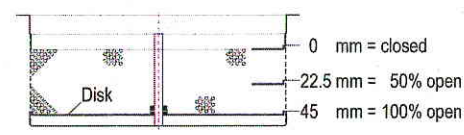
No.	Size	Type	Distributor basket: Throttle device [2] % open	Distributor basket: Aperture width / Disk lift mm	V̇-damper in connection spigot Damper angle α
1	DN 200	VSD	100	8	—[3]
2			50	4	—[3]
3			100	8	90° open
4			50	4	90° open
5			100	8	45°
6	DN 200	VPD	100	45.0	—[3]
7			50	22.5	—[3]
8			100	45.0	90° open
9			50	22.5	90° open
10			100	45.0	45°
11	DN 125	VD	100	5.0	—[3]
12			50	2.5	—[3]
13			100	5.0	90° open
14			50	2.5	90° open
15			100	5.0	45°



Left:
Adjustment of throttle device in the VSD distributor basket



V̇-Damper in connection spigot



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

1) The sound power level and pressure loss pertain to the use of the VSD, VPD and VD distributor baskets. When using VK and VND distributor baskets, the values approximate those for the VSD distributor basket.
2) The throttle devices in the distributor baskets enable continuous volume reduction, preferably up to 50% as well as full shutoff
3) Without connection box

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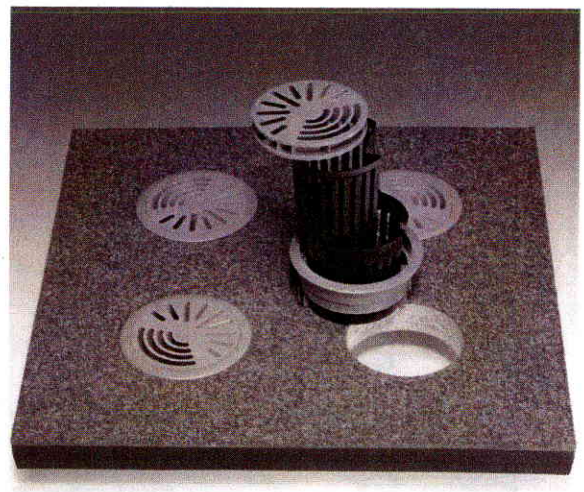
Rotary floor twist outlet

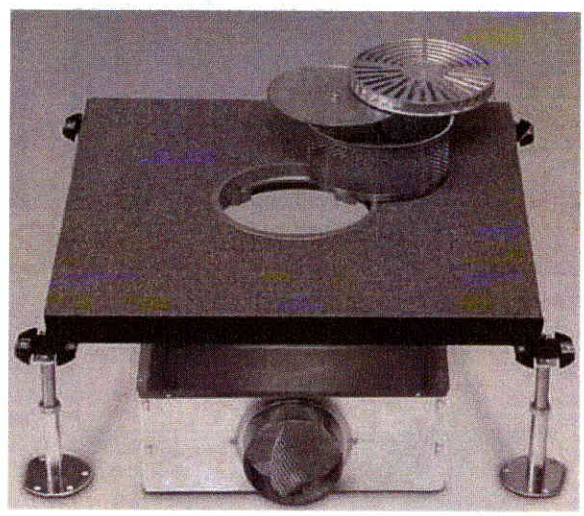
Sound power level and pressure loss

No.	Air outlet volume flow rate $\dot{V}_A$ l/s	$\dot{V}_A$ m³/h	Total pressure loss Δp_t Pa	Sound power level in dB ref. 10^{-12} W L_{WA} dB(A)	Octave band centre frequency in Hz 63	125	250	500	1 K	2 K	4 K
DN 200 with distributor basket **VSD**											
1	25	90	8	16	27	19	19	14	11	—	—
	33	120	15	24	35	27	27	22	19	11	—
	42	150	23	31	42	34	34	29	26	18	—
	50	180	34	36	47	39	39	34	31	23	11
2	25	90	17	24	28	24	25	22	20	12	—
	33	120	30	33	37	33	34	31	29	21	11
	42	150	48	39	43	39	40	37	35	27	17
3	25	90	12	20	17	24	23	18	15	—	—
	33	120	21	29	26	33	32	27	24	14	—
	42	150	34	35	32	39	38	33	30	20	10
	50	180	49	40	37	44	43	38	35	25	15
4	25	90	19	29	19	25	29	25	27	17	—
	33	120	35	37	27	33	37	33	35	25	16
	42	150	55	44	34	40	44	40	42	32	23
5	25	90	15	23	19	26	26	20	19	10	—
	33	120	27	31	27	34	34	28	27	18	—
	42	150	43	37	33	40	40	34	33	24	13
DN 200 with distributor basket **VPD**											
6	25	90	7	10	19	13	12	—	—	—	—
	33	120	11	18	27	21	20	16	13	—	—
	42	150	18	25	34	28	27	23	20	11	—
	50	180	26	30	39	33	32	28	25	16	—
7	25	90	15	23	26	18	17	15	19	18	—
	33	120	27	31	34	26	25	23	27	26	12
	42	150	43	37	40	32	31	29	33	32	18
8	25	90	12	18	17	20	20	16	14	—	—
	33	120	21	26	25	28	28	24	22	13	—
	42	150	34	33	32	35	35	31	29	20	—
	50	180	49	38	37	40	40	36	34	25	14
9	25	90	19	29	22	27	27	23	25	23	15
	33	120	35	37	30	35	35	31	33	31	23
	42	150	55	44	37	42	42	38	40	38	30
10	25	90	15	20	16	21	21	16	17	—	—
	33	120	27	29	25	30	30	25	26	18	—
	42	150	43	35	31	36	36	31	32	24	12
	50	180	62	40	36	41	41	36	37	29	17
DN 125 with distributor basket **VD**											
11	8	30	9	15	22	17	18	14	—	—	—
	11	40	16	22	29	24	25	21	16	—	—
	14	50	25	28	35	30	31	27	22	15	—
12	8	30	14	18	26	20	21	16	12	—	—
	11	40	24	26	34	28	29	24	20	13	—
	14	50	38	33	41	35	36	31	27	20	10
13	8	30	12	17	17	21	21	14	12	—	—
	11	40	21	25	25	29	29	22	20	11	—
	14	50	33	31	31	35	35	28	26	17	—
14	8	30	15	20	14	22	22	16	17	—	—
	11	40	27	28	22	30	30	24	25	15	—
	14	50	42	34	28	36	36	30	31	21	10
15		30	15	19	15	23	22	15	15	—	—
		40	27	27	23	31	30	23	23	14	—
		50	42	32	28	36	35	28	28	19	—

Size	Insertion loss in dB, Octave band centre frequency in Hz 63	125	250	500	1 K	2 K	4 K	8 K	Mean value
125	5	1	1	2	3	5	8	7	4
200	4	2	1	2	3	5	5	5	3
125	1	5	4	5	3	5	7	5	4
200	1	1	3	2	2	4	4	4	3

Without connection box With connetion box





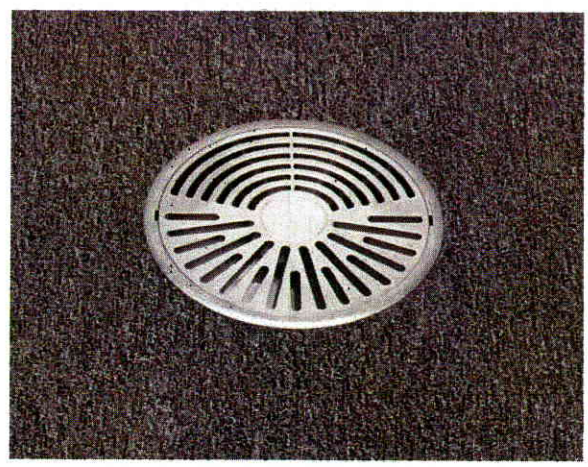


Figure 8: Rotary floor twist outlet with clamp insert for installation in through bore of floor tile,
Above: 4 DN 125 air outlets with VD distributor basket
Centre: 1 DN 200 air outlet with VPD distributor basket and connection box
Below: Installed DN 200 air outlet

DS 4074 E Bl. 8 04.2004

Rotary floor twist outlet

Data, types available, features

Technical data

Nominal diameter		DN 125	DN 200	
Air volume flow rate	l/s	5.5 – 16.5	14 – 50	
	m³/h	20 – 60	50 – 180	
Largely people max.	l/s	14	42	
	m³/h	50	150	
Max. temperature difference supply air-return air	K	± 10		
Supply air temperature	°C	18 – 30		
Max. bearing strength [1]	kg	600	400	1200
Twist element made of		PC	PC	Al
For tile size		Air outlets per tile, max.		
500 mm x 500 mm	units	4	1	
600 mm x 600 mm	units	4	1	
Min. air outlet spacing	m	approx. 0.25	approx. 0.6	
Min. distance between seat and air outlet	m	approx. 0.5	approx. 0.5	

1) With vertical single load on a central indent of 50 mm diameter; for materials see Types available; Al = aluminium; PC = polycarbonate

Types available

Rotary floor twist outlet		Size DN 125			DN 200		
Component		Materials [1] PC	Al	St	PC	Al	St
Twist element		●			●	●	
For installation in through bore: Clamp insert							
– with clamp collar	SR				● 4)	● 5)	
– with claw fastener	SK				● 4)	● 5)	
– with clamp nut	SM				● 4)		
– with rotary claw	SD	●					
For installation in through bore and stepped bore: Distributor							
– 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						●
– Distributor insert with throttle device	VD	●					
Connection box							
– without V-damper in spigot				●			●
– with V-damper in spigot [2]				●			●

1) PC = polycarbonate; Al = aluminium; St = galvanized steel
2) V-damper unnecessary for distributor basket with throttle device
4) Standard lock
5) Optional lock ● = available

Features

- Floor twist outlet with 30° jet axis incline to vertical
- For turbulent mixing air flow in the commercial sector
- Installation in conventional raised floor systems
- Air supply direct from the pressurized plenum or via connection box with flexible tubing
- Supply air flow in the direction of thermal flow, from floor to ceiling
- Intensive admixture of supply air and indoor air
- High ventilation effectiveness
- Air velocity adjustable in near zone of air outlet by rotating air outlet element: from full draught avoidance (velocity < 0.1 m/s) to fresh breeze (velocity 0.3 - 0.55 m/s)
- Jet temperature at a height of 1.2 m max. 1 K below mean room temperature
- Max. temperature difference supply air - return air ±10 K
- Minimum supply air temperature 18°C
- Low sound power level
- Minimum distance between air outlet and seat approx. 0.5 m
- Air volume flow rate 5.5 - 16.5 l/s (20 - 60 m^3/h) for DN 125 and 14 - 50 l/s (50 - 180 m^3/h) for DN 200
- Floor installation by insertion in a stepped bore or installation with a clamp insert in through bore of floor tile
- Fastening of clamp insert to floor tile either with clamp collar or claw fastener for DN 200, also with clamp nut for the plastic option; with rotary claw for DN 125
- Twist element and clamp insert made of polycarbonate, for DN 200 also of aluminium; connection box made of galvanized steel
- The DN 200 twist element can be locked against unauthorized this lock is
  – standard if clamp insert is made of polycarbonate,
  – optional if clamp insert is made of aluminium
- Different distributor baskets made of polycarbonate, with and without throttle device; additional distributor basket made of galvanized steel for DN 200
- In the centre of DN 200 air outlet blank surface for client trademark
- Can be walked over, driven over and can support a wheelchair

DS 4074 E Bl. 9 04.2004

This is the model used in GBCA fitout

IEQ-8: 1

Rotary floor twist outlet made of plastic

Tender text

Type code

DB – DK – DN___ – ____ – __ – _

- Floor twist outlet
- Function / Kind
- Size
- Distributor basket
- Clamp insert
- Connection type

Function / Kind:
D = Rotatable
K = Plastic

Size: DN 125 and DN 200

Distributor basket for DN 125:
VD = Distributor insert with throttle device

Distributor basket for DN 200:
VS = Standard type
VSD = Standard type with throttle device
VK = Short type
VN = Low type
VND = Low type with throttle device

Clamp insert for DN 125:
SD = Clamp insert with rotary claw

Clamp insert for DN 200:
SO = Without clamp insert (installation in stepped bore)
SM = Clamp insert with clamp nut for floor tiles
SK = Clamp insert with claw fastener for all floors
SR = Clamp insert with clamp collar for all floors

Connection type:
D = Pressurised plenum K = Connection box

Tender text

..... units rotary floor twist outlet for floor installation with high induction effect in floor zone for more rapid reduction of jet velocity and intensive energy exchange with ambient air;
air jet axis approx. at 30° incline to vertical as well as rotatable air outlet element for individual adjustment of air jet direction or air flow intensity at workplace, consisting of:

circular twist element with radial and circular slots, structured surface,

For **DN 125:**
☐ Clamp insert for installation in through bore of floor tile, with rotary claw.
Distributor basket with distributor insert with surrounding slots in basket casing including throttle device for reduction of supply air volume flow rate as required for the individual air outlet.

For **DN 200** (optional):
☐ Standard distributor basket with surrounding slots in basket casing ☐ including throttle device for reduction of supply air volume flow rate as required for the individual 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 for reduction of supply air volume flow rate as required for the individual air outlet.

☐ Clamp insert for the installation in through bore,
☐ with clamp collar. ☐ with claw fastener.
☐ with clamp nut.
Lock for the twist element against unauthorized removal.

☐ Connection box [2] for direct connection of air outlet to a flexible tube; ☐ with V̇-damper adjustable from room [3].

Air outlet can be walked over, driven over and can support a wheelchair.

Materials:

– Twist element:	polycarbonate
– Clamp insert:	polycarbonate
– Distributor basket:	polycarbonate
– Connection box:	galvanized steel

Colour of visible air outlet parts:
painted similar to RAL 7037, dust grey;
(other colours on request)

Technical data:

Volume flow rate:	..... l/s (m^3/h)
Size:	DN .....
Perm. sound power level:	..... dB(A) ref. 10^{-12} W
Bearing strength: [1]	max. ..... kg
Make:	KRANTZ KOMPONENTEN
Type:	DB - DK - DN___ - ___ - ___ - __

1) With vertical single load on a central indent of 50 mm diameter
2) Available for DN 125 and DN 200
3) V̇-damper unnecessary for distributor basket with throttle device

DS 4074 E Bl. 10 05.2006

Subject to technical alterations!

Rotary floor twist outlet made of aluminium

Tender text

Type code

DB – DA – DN___ – ____ – __ – _

Floor twist outlet | Function / Kind | Size | Distributor basket | Clamp insert | Connection type

Function / Kind:
D = Rotatable
A = Aluminium

Size:
DN 200

Distributor basket:
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 = Pressurised plenum K = Connection box

Tender text

..... units rotary floor twist outlet for floor installation with high induction effect in floor zone for more rapid reduction of jet velocity and intensive energy exchange with ambient air;
air jet axis approx. at 30° incline to vertical as well as rotatable air outlet element for individual adjustment of air jet direction or air flow intensity at workplace, consisting of:

circular twist element with radial and circular slots, structured surface,

Optional:
☐ Standard distributor basket with surrounding slots in basket casing ☐ including throttle device for reduction of supply air volume flow rate as required for the individual 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 for reduction of supply air volume flow rate as required for the individual air outlet.

☐ Perforated sheet metal distributor, including throttle device for reduction of supply air volume flow rate as required for the individual air outlet.

☐ Clamp insert for the installation in through bore,
☐ with clamp collar, ☐ with claw fastener,
☐ with clamp nut,
☐ and with lock for the twist element against unauthorized removal.

☐ Connection box for direct connection of air outlet to a flexible tube; ☐ with V̇-damper adjustable from room [2].

Air outlet can be walked over, driven over and can support a wheelchair.

Materials:

– Twist element:	aluminium
– Clamp insert:	aluminium
– Distributor basket:	☐ galv. steel ☐ polycarbonate
– Connection box:	galvanized steel

Colour of visible air outlet parts:
Aluminium type natural colour
(powder-coated on request)

Technical data:

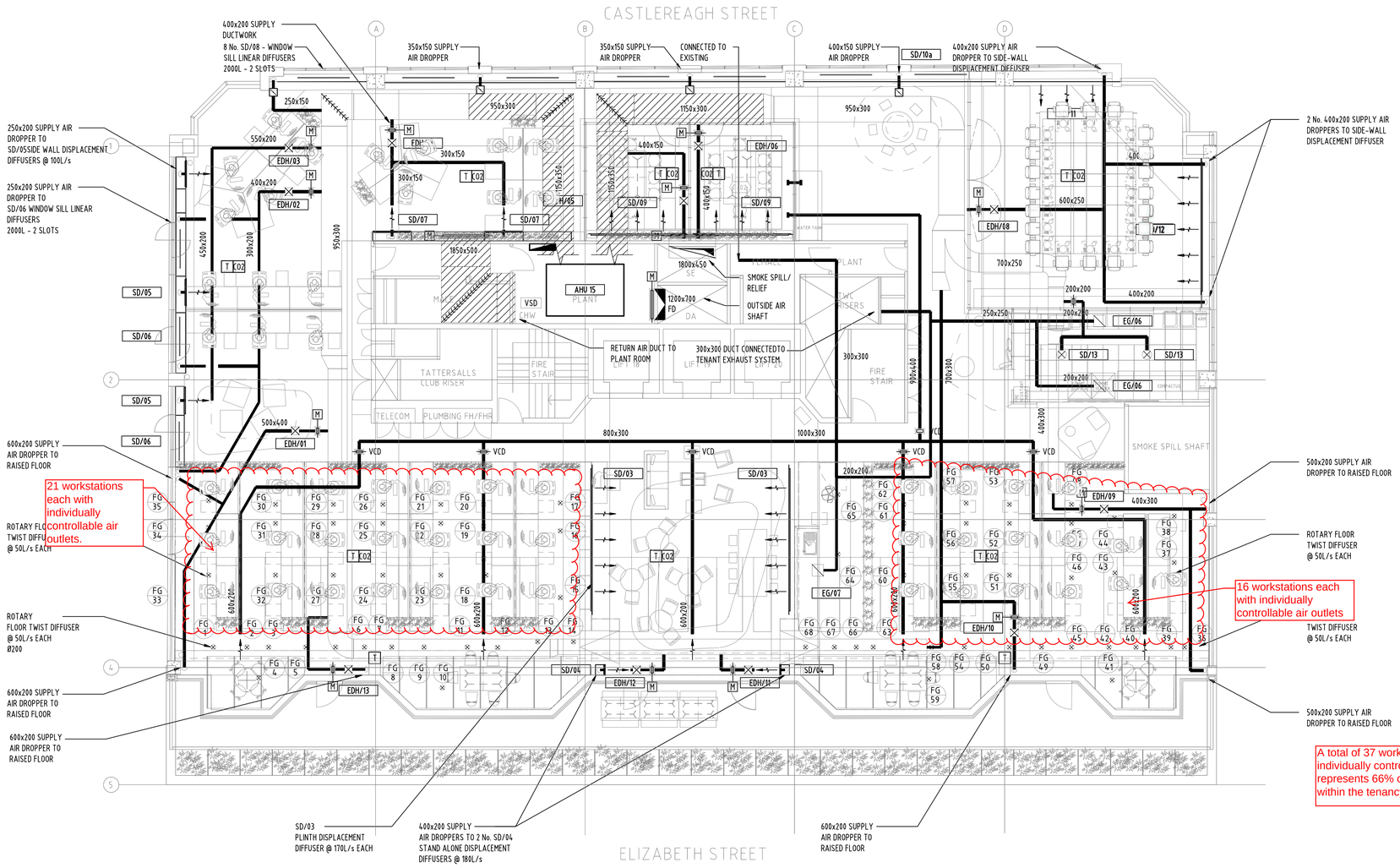
Volume flow rate:	..... l/s (m^3/h)
Size:	DN .....
Perm. sound power level:	..... dB(A) ref. 10^{-12} W
Bearing strength: [1]	max. ..... kg
Make:	KRANTZ KOMPONENTEN
Type:	DB - DA - DN___ - ___ - ___ - __

1) With vertical single load on a central indent of 50 mm diameter
2) V̇-damper unnecessary for distributor basket with throttle device

DS 4074 E Bl. 11 05.2006

Subject to technical alterations!

IEQ-8: 2



LEGEND

- AxB — RECTANGULAR DUCTWORK
- SUPPLY AIR DUCTWORK
- RETURN AIR DUCTWORK
- EXHAUST AIR DUCTWORK
- DROPPER
- SD/xx — STAND ALONE DISPLACEMENT DIFFUSER
- SD/xx — SIDE WALL DISPLACEMENT DIFFUSER
- SD/xx — SWIRL DIFFUSER
- ROTARY FLOOR DIFFUSER
- EG/xx — RETURN/EXHAUST AIR GRILLE
- FD — FIRE DAMPER
- VCD — VOLUME CONTROL DAMPER
- M — MOTORISED DAMPER
- EDH/xx — ELECTRICAL DUCT HEATER
- T — TEMPERATURE SENSOR
- CO2 — CO2 SENSOR
- DISTRIBUTION BOARD
- FG 48 — FLOOR DIFFUSER NO.

N

Rev	Description	By	Date
A	AS BUILT	ENRAVEL	11.03.2009

CONSULTANT

Lincolne Scott

Consulting Engineers
Adelaide Auckland Bangkok
Brisbane Cairns Honolulu
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AIR CONDITIONING & MECHANICAL CONTRACTORS
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476 GARDENERS ROAD
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P.O.BOX 636
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BRISBANE
MOUNT ISA
MELBOURNE HEAD OFFICE

CLIENT

GBCA

Project

LEVEL 15
179 ELIZABETH STREET
SYDNEY NSW 2000

Drawing Title

DUCTWORK LAYOUT
L15

CAD File	Drawn -
Coordinated	Scale 1:100 @A1
Project Architect	Date 11-03-09
Project Director	

PTW Project No.	Drawing Number	Rev
-	ST 236-M01 A	A
JLW Project No. ST 236		

AS BUILT

JAMES L .WILLIAMS PTY LTD

ESTABLISHED 1875

AIR SYSTEM TEST SHEET

Client GBCA Date: 9/03/2009

Job Name 179 ELIZABETH ST SYDNEY J/N

System LEVEL 15 SUPPLY AIR Page

Test Method VANE ANEMOMETER Tested by : T.V

Drg No. AS BUILT ST236-M01A

Outlet No.	Outlet Size mm	K Factor	Outlet Area m^2	DESIGN		ACTUAL	
				Vel M/S	Vol L/S	Vel M/S	Vol L/S
1	200 Dia		0.049	1.02	50	0.80	39
2	200 Dia		0.049	1.02	50	0.85	42
3	200 Dia		0.049	1.02	50	0.90	44
4	200 Dia		0.049	1.02	50	0.95	47
5	200 Dia		0.049	1.02	50	0.85	42
6	200 Dia		0.049	1.02	50	0.85	42
7	200 Dia		0.049	1.02	50	0.70	34
8	200 Dia		0.049	1.02	50	0.85	42
9	200 Dia		0.049	1.02	50	0.80	39
10	200 Dia		0.049	1.02	50	0.85	42
11	200 Dia		0.049	1.02	50	0.80	**39**
12	200 Dia		0.049	1.02	50	0.75	37
13	200 Dia		0.049	1.02	50	0.75	**37**
14	200 Dia		0.049	1.02	50	0.80	39
15	200 Dia		0.049	1.02	50	0.80	39
16	200 Dia		0.049	1.02	50	0.70	34
17	200 Dia		0.049	1.02	50	0.75	**37**
18	200 Dia		0.049	1.02	50	0.75	37
19	200 Dia		0.049	1.02	50	0.70	34
20	200 Dia		0.049	1.02	50	0.75	37
21	200 Dia		0.049	1.02	50	0.75	37
22	200 Dia		0.049	1.02	50	0.70	34
23	200 Dia		0.049	1.02	50	0.75	37
24	200 Dia		0.049	1.02	50	0.70	34
25	200 Dia		0.049	1.02	50	0.80	39
26	200 Dia		0.049	1.02	50	0.80	39
27	200 Dia		0.049	1.02	50	0.85	42
28	200 Dia		0.049	1.02	50	0.85	42
29	200 Dia		0.049	1.02	50	0.85	42
30	200 Dia		0.049	1.02	50	0.80	39
31	200 Dia		0.049	1.02	50.00	0.75	37

JAMES L .WILLIAMS PTY LTD

ESTABLISHED 1875

AIR SYSTEM TEST SHEET

Client	GBCA	Date:	9/03/2009
Job Name	179 ELIZABETH ST SYDNEY	J/N	
System	LEVEL 15 SUPPLY AIR	Page	
Test Method	VANE ANEMOMETER	Tested by :	T.V
Drg No.	AS BUILT ST236-M01A		

Outlet No.	Outlet Size mm	K Factor	Outlet Area m^2	DESIGN Vel M/S	DESIGN Vol L/S	ACTUAL Vel M/S	ACTUAL Vol L/S
32	200 Dia		0.049	1.02	50	0.75	37
33	200 Dia		0.049	1.02	50	0.90	44
34	200 Dia		0.049	1.02	50	0.80	39
35	200 Dia		0.049	1.02	50	0.75	37
36	200 Dia		0.049	1.02	50	0.70	34
37	200 Dia		0.049	1.02	50	0.75	37
38	200 Dia		0.049	1.02	50	0.65	32
39	200 Dia		0.049	1.02	50	0.85	42
40	200 Dia		0.049	1.02	50	0.90	44
41	200 Dia		0.049	1.02	50	0.95	47
42	200 Dia		0.049	1.02	50	0.90	44
43	200 Dia		0.049	1.02	50	0.90	44
44	200 Dia		0.049	1.02	50	0.80	39
45	200 Dia		0.049	1.02	50	0.90	44
46	200 Dia		0.049	1.02	50	0.80	39
47	200 Dia		0.049	1.02	50	0.90	44
48	200 Dia		0.049	1.02	50	0.90	44
49	200 Dia		0.049	1.02	50	0.90	44
50	200 Dia		0.049	1.02	50	0.70	34
51	200 Dia		0.049	1.02	50	0.70	34
52	200 Dia		0.049	1.02	50	0.80	39
53	200 Dia		0.049	1.02	50	0.90	44
54	200 Dia		0.049	1.02	50	0.80	39
55	200 Dia		0.049	1.02	50	0.70	34
56	200 Dia		0.049	1.02	50	0.75	37
57	200 Dia		0.049	1.02	50	0.80	39
58	200 Dia		0.049	1.02	50	0.80	39
59	200 Dia		0.049	1.02	50	0.85	42
60	200 Dia		0.049	1.02	50	0.80	39
61	200 Dia		0.049	1.02	50	0.80	39
62			0.049	1.02	50	0.75	37

JAMES L .WILLIAMS PTY LTD

ESTABLISHED 1875

AIR SYSTEM TEST SHEET

Client	GBCA	Date:	9/03/2009
Job Name	179 ELIZABETH ST SYDNEY	J/N	
System	LEVEL 15 SUPPLY AIR	Page	
Test Method	VANE ANEMOMETER	Tested by :	T.V
Drg No.	AS BUILT ST236-M01A		

Outlet No.	Outlet Size mm	K Factor	Outlet Area m^2	DESIGN Vel M/S	DESIGN Vol L/S	ACTUAL Vel M/S	ACTUAL Vol L/S
63	200 Dia		0.049	1.02	50	0.80	39
64	200 Dia		0.049	1.02	50	0.80	39
65	200 Dia		0.049	1.02	50	0.80	39
66	200 Dia		0.049	1.02	50	0.80	39
67	200 Dia		0.049	1.02	50	0.80	39
68	200 Dia		0.049	1.02	50	0.75	37

NOTE: ALL FLOOR GRILLES ARE ADJUSTABLE VIA THE CENTRE INSERT WHICH IS ACCESSED BY REMOVING THE CORE. THE GRILLES HAVE ALSO BEEN MANUFACTURED WITH NON ADJUSTABLE AIR FLOW DIRECTION VAINE WHICH CAN BE ROTATED TO DEFLECT THE AIR TO THE DESIRED DIRECTION.

IEQ-8: 4

Client

Bligh Voller Nield Architecture

GBCA Offices Fit-out
Level 15, 179 Elizabeth Street, Sydney
Mechanical Services Scope of Works
SYD0703900

14h November 2007

Lincolne Scott Australia Pty Ltd
ABN 47 005 113 468
Level 1 41 McLaren Street
P O Box 6245 North Sydney
New South Wales 2060 Australia
Email sydney@lincolne.com
Telephone 61 2 8907 0900
Facsimile 61 2 9957 4127

Authorised for Issue Astrid Siohan (Project Leader) 14/11/07 (Date)

IEQ-8: 4

TABLE OF CONTENTS

1. SCOPE OF WORKS 2

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1.2 SCOPE OF WORKS 2

2. DESIGN CRITERIA 4

Revision No.	Section & Page No.	Issue/Amendment	Author	Project Engineer	Approved	Date
A	All	Initial Issue for Tender	AAS	AAS	-	22/10/2007
B	All	Construction Issue	AAS	AAS	CJ	14/11/2007

1. SCOPE OF WORKS

1.1 GENERAL

The mechanical services for the GBCA Offices Fit-out will incorporate the following: -

- Heating, ventilation & air conditioning to open plan office area, board room, meeting rooms and members' lounge/café.
- Exhaust air system to kitchenette & Utilities/ store from base building tenant exhaust system.

1.2 SCOPE OF WORKS

The works on the existing ventilation and air conditioning installations shall include the following:

- Confirm for the existing equipments to be re-used:
  - Supply air flow and fan static pressure
  - Cooling coil: chilled water temperature and flow rate
  - Duct-mounted heaters capacities
  - Tenant exhaust provision
  - Relief/smoke exhaust air flow rate and fan static pressure
  - Maximum outside air flow rate
- Remove existing flexible ductwork, rigid ductwork, VAV boxes as indicated on the drawing.

Note: removal from floor by others.

- Disconnect & remove cabling to VAV boxes electrical re-heaters.
- Blank-off un-used ductwork connections
- Clean existing re-used ductwork and air handling unit (AHU)
- Replace existing AHU air intake bag filter with F7 panel filter.
- Supply & install VSD on existing AHU fan.
- Up-grade existing fan motor to suit air flows as indicated to equipment data sheet.
- Supply & install supply air system including ductwork, dampers, motorised dampers, electrical duct heaters and supply air diffusers as indicated on the drawing.

Note: Circular Supply air ductwork shall be rigid. Power shall be provided to re-heaters from the existing mechanical distribution board in plant room.

- Supply and install return air system including ductwork, dampers and exhaust air grilles as indicated on the drawing.

- Supply and install exhaust air system including ductwork, dampers and grilles as indicated on drawings. Connect to existing Tenant General Exhaust riser.

- Provision of new controls as detailed in ventilation and controls schematic, connect to existing control panel in the plant room and connect to base building BMS.

- Commissioning of the air conditioning ventilation and smoke control systems.

- Provide shop and as-built drawings.

IEQ-8: 4

2. DESIGN CRITERIA

Item	Design Criteria
External ambient conditions (for air conditioning plant full load performance)	Summer 32°C dry bulb maximum 25°C wet bulb maximum Full solar load Winter 10.5°C dry bulb minimum Internal loads included
Internal conditions (for conditioning plant full load performance)	Summer 24.0°C dry bulb maximum at point of control (26.0°C dry bulb in Eastern perimeter area) Winter 21.0°C dry bulb minimum at point of control
Humidity control	Relative humidity controlled by virtue of cooling coil performance.
Controls tolerance for air conditioning system	±2°C dry bulb at point of control
Outside Air	50% improvement to AS 1668.2-1991 requirements
Exhaust Air	In accordance with AS 1668.2:1991 requirements
Infiltration	1 air changes per hour for all perimeter areas
Occupancy	1 person per 10m^2
Hours of Operation Supply Air	12 hours from existing floor Air Handling Unit Air distribution is to provide even, draught free air movement and to be readily amenable to modification to suit partitioning alterations. Air movement to be between 0.1 and 0.25 m/s in occupied spaces measured 1.0 to 1.5m above floor level.
Internal Heat Gains:	
- People: - General office lighting: - Equipment:	70 W/person sensible / 60 W/person latent 8W/m^2 15 W/m^2 NLA (LCD monitors throughout)
Tenancy Provisions:	**Exhaust Air Systems** 400 L/s

IEQ-8: 5

ESTABLISHED 1875

James L Williams Pty Ltd

Air Conditioning & Mechanical Services

ACN 004 122 650 ABN 17 004 122 650

12th June 2008

Joe Karten
Technical Coordinator
Green Building Council of Australia
Level 15, 179 Elizabeth Street
Sydney, NSW 2000

Dear Joe,

This letter confirms that the HVAC system of the GBCA Tenancy Fitout at Level 15, 179 Elizabeth Street, has been altered in the following manner:

- Displacement ventilation has been installed in the fitout under a raised floor and via plenums along façade and in meeting rooms.
- Individual airflow controls have been installed in raised floor to allow for individual comfort control at each workstation.

Furthermore, I confirm that no supplementary air was specified or installed in the tenancy fitout.

Feel free to contact me with any questions you may have.

Kind regards,

Paul Glekas
Project Manager B.E. SYDU (HONS)

James L. Williams Pty Ltd.
Unit 10/476 Gardeners Road, Alexandria NSW 2015Ph: (02) 8338 5888 Fax: (02) 9313 5612