Krantz Components

Twist outlet DD-N....
for ceiling installation

Air distribution systems

DS 1175 E 06.2014

Twist outlet

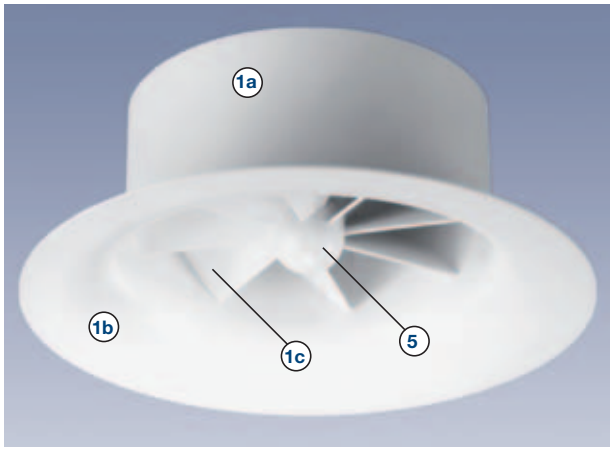
Preliminary remarks and construction design

Preliminary remarks

Twist outlets for ceiling installation are proven air outlets from Krantz Components for the commercial and industrial sectors. Thanks to their favourable aerodynamics and acoustics, their attractive appearance and easy installation, these outlets have been put to successful use for decades. They are particularly suitable for commercial rooms with high-quality indoor air flow requirements such as office buildings, schools, hospitals, etc.

Construction design

The twist outlet **1** consists of the spigot **1a** with shaped circular face **1b** and built-in twist vanes **1c**. The twist outlet is fastened centrally with the plug **5**.



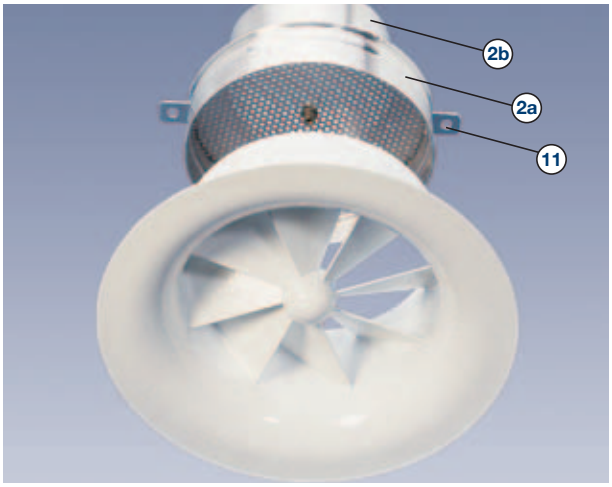
Twist outlet

Different connection types are available for connecting the twist outlet to the duct system:

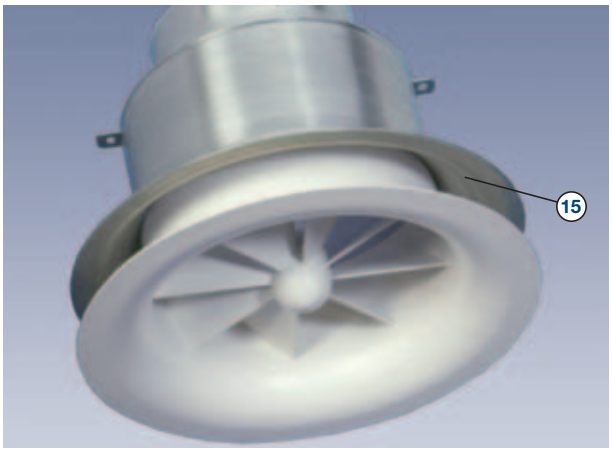
Connection type A [1)]
In connection type A, a reducer **2** is used for duct connection. On the one side of the reducer is the sleeve **2a** for the twist outlet and on the other side is the duct connection spigot **2b**.
The reducer is fitted with two L-suspensions **11** on opposite sides for fastening the outlet to the ceiling.
Connection type A is largely used for fitting twist outlets into closed false ceilings or above open grid ceilings.

Connection type AF [1)]
Connection type AF is essentially the same as connection type A except that here the reducer with the flange **15** is fitted on the false ceiling from above and the twist outlet is inserted from below through the false ceiling until it is flush with it. The distance between the circular face of the twist outlet and the support flange of the reducer AF is variable; it can be adjusted to the thickness of the false ceiling.

With connection types A and AF twist outlets can be used at very low cost.



Connection type A



Connection type AF

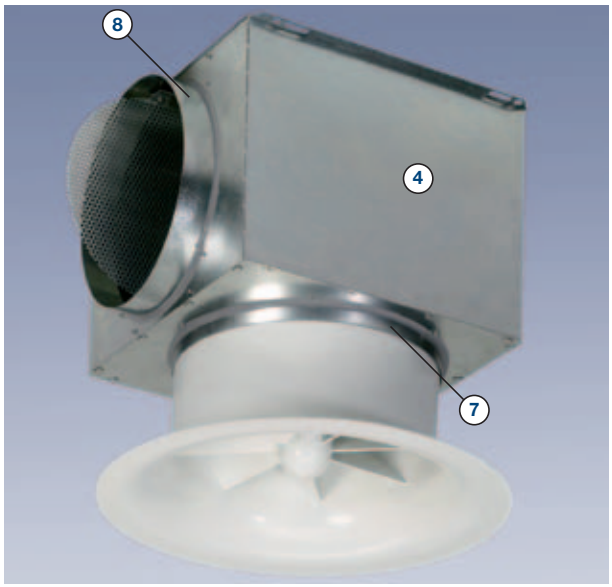
Connection types D and E [1)]
The connection to the duct system is made via a flat connection box **4**.
In connection type D, the twist outlet is fitted onto an external sleeve **7**; in connection type E, it is inserted into the connection box, with the face **1b** being flush with the box bottom.
The connection via connection box is effective in rooms with low ceiling plenums:
– connection type D with thicker false ceilings,
– connection type E with thinner false ceilings.
Connection type E is also advantageous for outlets placed above an open grid ceiling or exposed.

[1)] See also installation options on page 5

Twist outlet

Mode of operation, return air inlets, sound power level and pressure drop

In general:
With all connection types the twist outlet is inserted from below and fastened at the plug **5** with a central screw **10**.
A side of the connection box is fitted with a spigot **8** for connection to a flexible or spiral seam duct. This spigot may be fitted with a volume flow damper **9** adjustable from the room.
The connection box is also available with acoustic lining for higher insertion loss.
The advantages of the connection box are low height, simple volume flow rate setting and good insertion loss.



Connection type D

Connection type E

Perforated cover screen
Where a visually plane ceiling surface is required, a perforated cover screen is available for the twist outlet. This cover screen is fastened from below with the central screw **10**.

Twist outlet with perforated cover screen

Mode of operation

The vanes of the air outlet produce a twist effect and the curved exit causes an additional horizontal jet deflection. The horizontal, radial jets bring about an intensive admixture of indoor air and, as a result, rapid equalization of supply air temperature with indoor air temperature.
Twist outlets from Krantz Components belong to the diffuse air distribution system where there is no steady air jet pattern in the occupied zone. Thanks to the very high induction effect of the supply air jets, the vertical and horizontal temperature distribution is extremely even in air-conditioned rooms. Twist outlets can be used up to a temperature difference of –12 K when cooling and +5 K when heating.

Return air inlets

Twist outlets can also be used as return air inlets. This applies for all connection types. A return air inlet with cover screen (without twist vanes) is also part of our standard range of products.

Sound power level and pressure drop

Typical features of Krantz Components twist outlets are low sound power level and pressure drop. These depend on size, connection type and volume flow rate. For example, for a DN 250 twist outlet with connection type D and a volume flow rate of about 110 l/s [400 m^3/h]:
– sound power level = 39 dB(A) ref. 10^{-12} W
– pressure drop = 47 Pa.

For diagrams and tables see pages 8 – 12.

Twist outlet

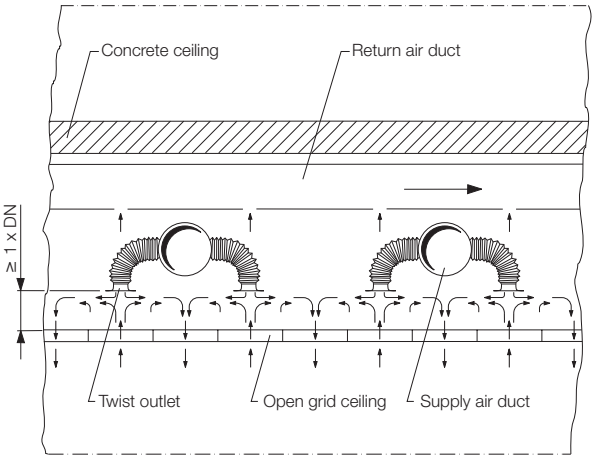
Design specifications and features

Design specifications

The twist outlets can be installed in closed false ceilings, visibly, or above open grid ceilings, i.e. invisible from the room. This is made very easy by the different connection types. The vertical distance between the upper edge of the open grid ceiling and the discharge level should be ≥ 1 x DN.
In air distribution with twist outlets, supply air and return air openings may be located close together. Disruptions in jet dispersion or short-circuiting are ruled out if the height difference between the lower edge of the return air opening and the discharge level of the twist outlet is kept to min. 250 mm. If the twist outlet and the return air opening are at the same level, the horizontal centre spacing should amount to at least five times the nominal diameter (5 x DN).

Features

- Diffuse air distribution system
- Maximum temperature difference between supply air and indoor air:
  –12 K when cooling, +5 K when heating (+10 K up to 3 m room height)
- Stable jet pattern also at minimum volume flow rate
- Discharge height from 2.2 to 4.5 m
- Low sound power level
- Installation options: inside a false ceiling, above an open grid ceiling, or exposed
- Twist element easy to mount from below and to fasten with central screw
- Twist element made from polystyrene or aluminium
- Optionally available with perforated cover screen for visually plane ceiling surface
- Connection types A and AF with reducer for connection to flexible duct
- Connection types D and E with connection box and spigot; connection box D with built-in volume flow damper adjustable from room; connection box E with volume flow damper adjustable at the spigot or from room; connection boxes D and E optionally available with acoustic lining
- The twist outlets (with all connection types) can also be used as return air inlets
- A return air inlet with cover screen is available as standard for sizes DN 100 to DN 355



Example of supply air distribution via twist outlets above an open grid ceiling. The return air is removed evenly over the whole ceiling and extracted via a return air duct placed above the twist outlets.

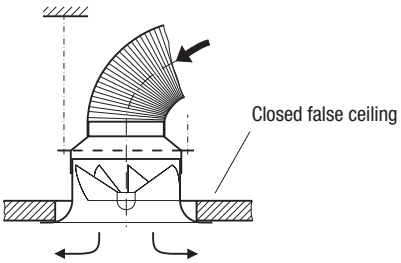
Twist outlet installed in a closed false ceiling

Twist outlet in the entrance hall of DEA Mineralöl AG, Hamburg / D

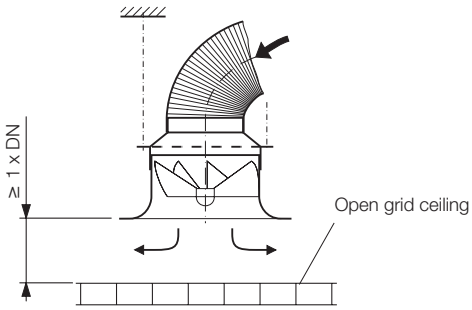
Twist outlet

Installation options

Connection type A

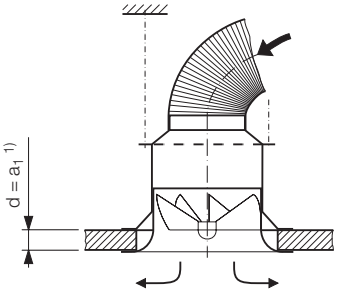


Installation in closed false ceiling



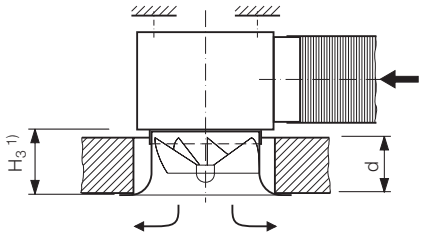
Placement above open grid ceiling

Connection type AF



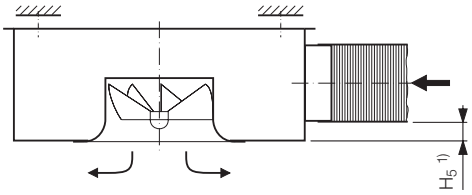
Reducer with flange for fitting on false ceiling. The size a_1 is variable; it corresponds to the thickness 'd' of the false ceiling.

Connection type D

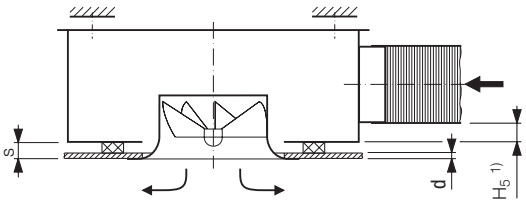


Installation in closed false ceiling with larger thickness ($d < H_3$).

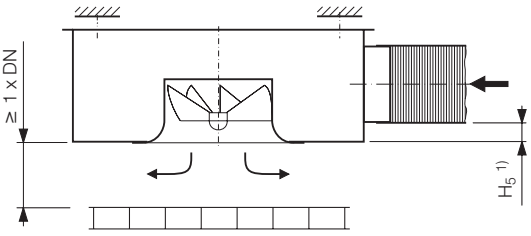
Connection type E



Visible installation (without false ceiling)



Installation in very thin false ceilings (from plasterboard or sheet metal) with low ceiling plenums. A seal is to be inserted by the client between the connection box and the false ceiling.

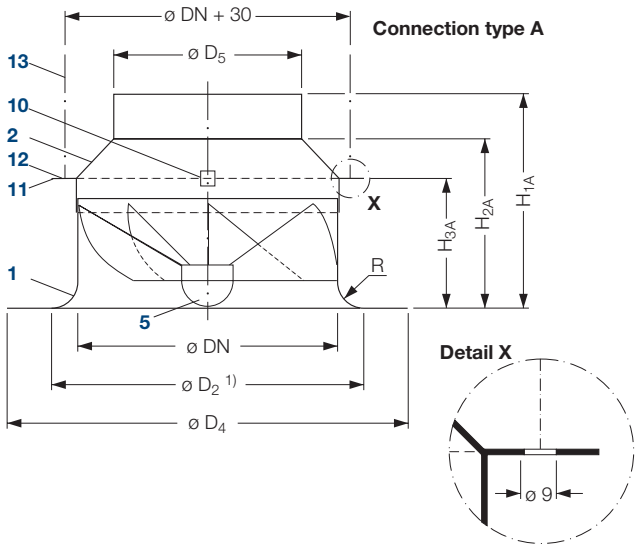


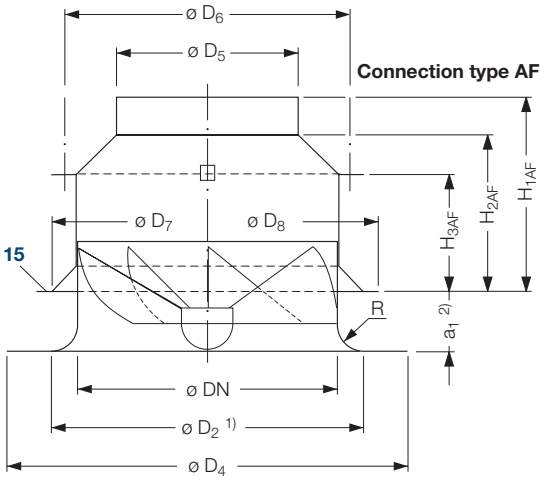
Installation above open grid ceilings, particularly effective with very low plenums.

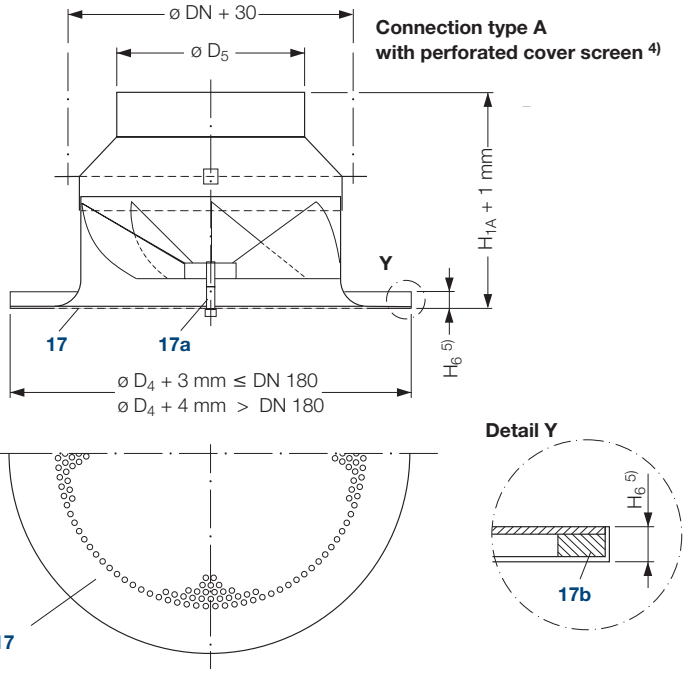
[1] See tables on pages 6 and 7

Twist outlet, connection types A and AF

Dimensions







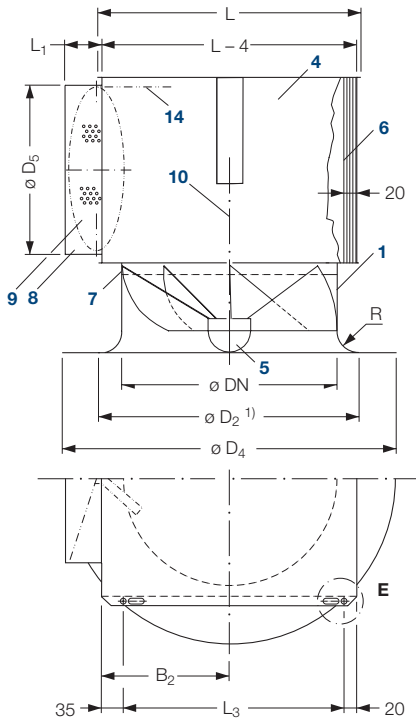
Key for all pages		Material
1	Twist outlet	Polystyrene or aluminium
2	Reducer	Aluminium
4	Connection box	Galvanized sheet metal
5	Plug with internal thread	Polystyrene or aluminium
6	Acoustic lining (optional)	Mineral wool with glass fibre mat, non-flammable
7	Sleeve	Galvanized sheet metal or steel
8	Connection spigot	
9	Volume flow damper (optional)	
10	Fastener for twist outlet up to DN 180 with M6 thread from DN 250 with M8 thread	
11	L-suspension 3)	
12	Bore for suspension	
13	Suspension device	
13a	Quick fastener (by others)	
13b	Threaded rod (by others)	
14	Adjustment device for volume flow damper (optional)	
15	Flange	Aluminium
17	Perforated cover screen	
17a	Spacer	
17b	Spacer ring (for DN 100 to DN 180)	–

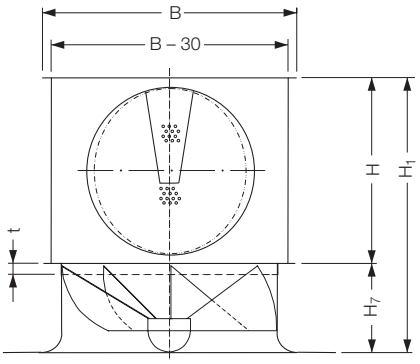
Nom. ø DN	Material of twist outlet	H_{1A} mm	H_{2A} mm	H_{3A} mm	H_{1AF} mm	H_{2AF} mm	H_{3AF} mm	$H_{6\,min}$ 5) mm	D_2 1) mm	D_4 mm	D_5 mm	D_6 mm	D_7 mm	D_8 mm	R mm	a_1 2) mm	Weight in kg A	Weight in kg AF
100	Polystyrene	111	71	69	117	77	71	8	137	165	99	130	137	161	10	0 to 34	0.2	0.4
125	Polystyrene	152	112	98	160	120	101	8	172	200	99	155	172	200	23	0 to 63	0.2	0.5
160	Polystyrene	158	118	99	164	124	101	10	222	250	124	190	222	237	18	0 to 64	0.4	0.7
180	Polystyrene	179	139	127	183	143	126	10	247	280	159	212	252	280	34	0 to 92	0.5	1.0
250	Polystyrene	236	196	160	239	199	156	12	339	380	179	285	340	380	45	0 to 120	0.9	1.5
	Aluminium	211	171	135					300						25	0 to 95	1.3	1.9
315	Polystyrene	287	247	200	289	249	196	15	434	490	223	350	435	475	60	0 to 160	1.6	2.3
	Aluminium	250	210	163					378						32	0 to 123	2.1	3.0
355	Aluminium	292	232	178	255	215	156	18	426	550	249	390	427	467	36	0 to 138	2.7	4.0

1) Ceiling cutout
2) Variable
3) Size DN 355 has a third L-suspension offset at 90°
4) Also available for connection types AF, D and E
5) Other heights on request

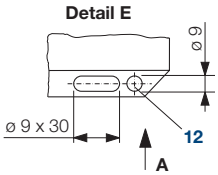
Twist outlet, connection types D and E

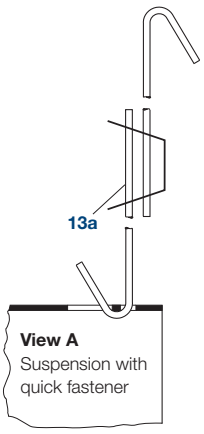
Dimensions [2]

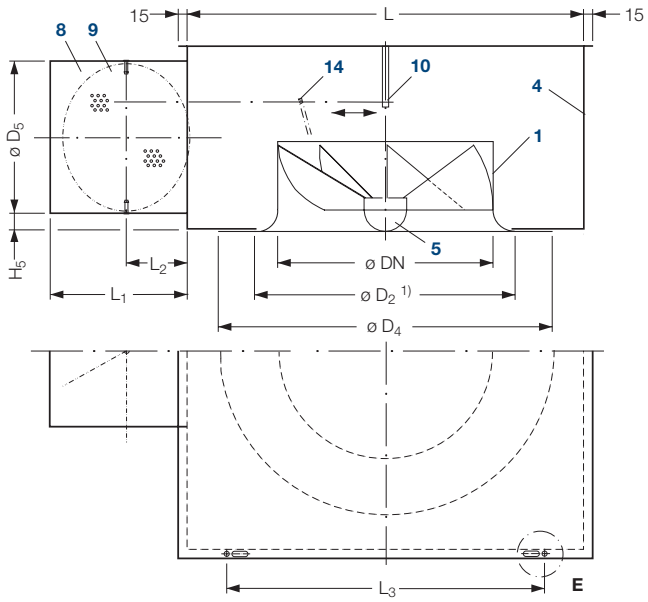


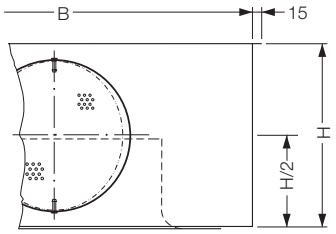


Connection box D

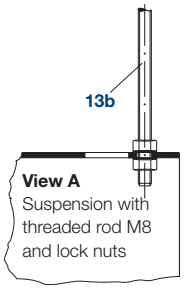








Connection box E



[1] Ceiling cutout

[2] With perforated cover screen, see connection type A on page 6

					Connection box D											Connection box E								
Nom. ø **DN**	Material of twist outlet	D_2 [1] mm	D_4 mm	R mm	L mm	B mm	B_2 mm	H mm	H_1 mm	H_7 mm	D_5 mm	L_1 mm	L_3 mm	t mm	W kg	L mm	B mm	H mm	H_5 mm	D_5 mm	L_1 mm	L_2 mm	L_3 mm	W kg
100	Polystyrene	137	165	10	165	180	90	125	174	49	99	40	110	25	1.8	300	300	135	18	99	95	35	171	1.6
125	Polystyrene	172	200	23	190	205	103	125	203	78	99	40	135	25	2.0	300	300	135	18	99	95	35	171	1.8
160	Polystyrene	222	250	18	225	240	120	150	229	79	124	40	170	30	2.8	380	380	180	28	124	95	35	251	2.4
180	Polystyrene	247	280	34	245	260	130	185	292	107	159	40	190	30	3.3	380	380	180	10	159	135	55	251	3.1
250	Polystyrene	339	380	45	315	330	165	225	360	135	199	60	260	35	5.0	500	500	250	35	179	155	65	371	4.9
	Aluminium	300		25					335	110					5.4									5.3
315	Polystyrene	434	490	60	380	395	198	275	450	175	249	60	325	35	7.0	600	600	250	13	223	200	90	471	6.8
	Aluminium	378		32					413	138					7.6									7.3
355	Aluminium	426	550	36	420	435	218	305	458	153	279	60	365	35	9.6	650	650	300	25	249	225	100	521	9.6

Twist outlet

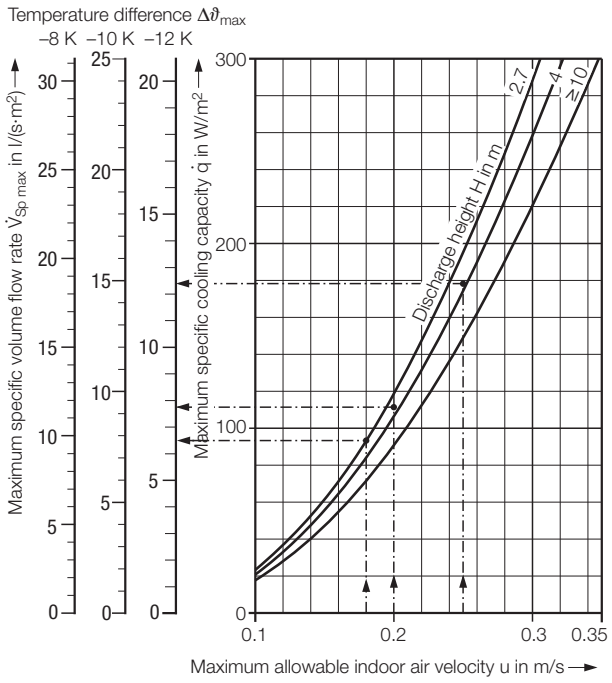
Comfort criteria

Comfort criteria [1)]

The outlet layout must comply with the maximum allowable indoor air velocities u in the occupied zone in the cooling mode. The indoor air velocity depends on the cooling load that is to be removed from the room. The maximum specific cooling capacity $\dot{q}$ depends on the discharge height and the maximum allowable indoor air velocity u (Graph 1).

Graph 1 enables to determine for the cooling mode the maximum specific volume flow rate $\dot{V}_{Sp\ max}$ in relation to the maximum specific cooling capacity and the maximum temperature difference $\Delta\vartheta_{max}$. The volume flow rate supplied to the room $\dot{V}_{Sp\ tats}$ may not exceed this value.

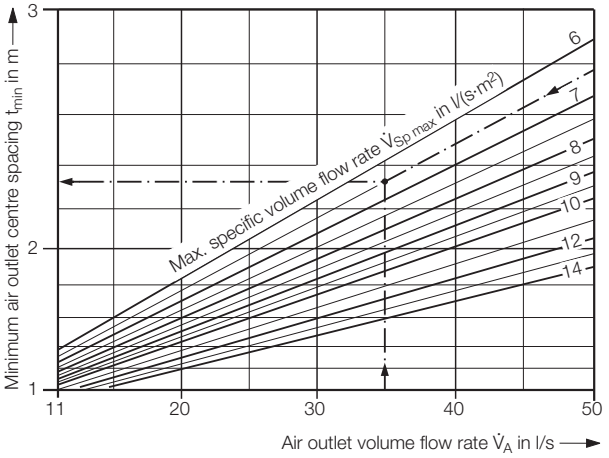
Graph 2 enables to determine the minimum centre spacing between two outlets on the basis of the maximum specific volume flow rate.

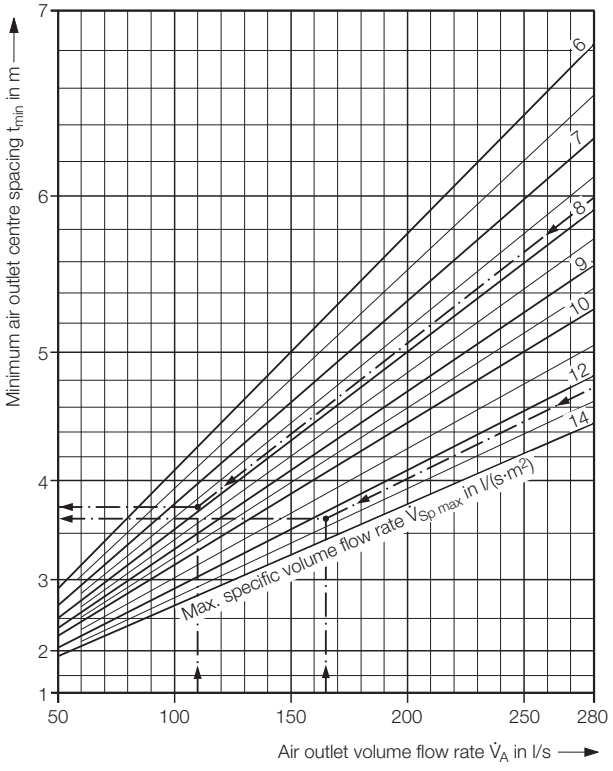


Graph 1: Max. specific volume flow rate

Key for layout:

$\dot{V}_A$ = volume flow rate per air outlet in l/s
$\dot{V}_{A\ max}$ = max. volume flow rate per air outlet when cooling in l/s
$\dot{V}_{A\ min}$ = min. volume flow rate per air outlet when cooling in l/s
$\dot{V}_{Sp\ max}$ = max. specific volume flow rate per m² in l/(s·m²)
$\dot{V}_{Sp\ tats}$ = actual specific volume flow rate per m² of floor area in l/(s·m²)
u = max. allowable indoor air velocity in m/s
$\dot{q}$ = max. specific cooling capacity in W/m²
$\Delta\vartheta_{max}$ = max. temperature difference supply air to return air in K
t_{min} = minimum air outlet centre spacing in m
H = discharge height in m
L_{WA} = sound power level in dB(A) ref. 10^{-12} W
Δp_t = total pressure drop in Pa



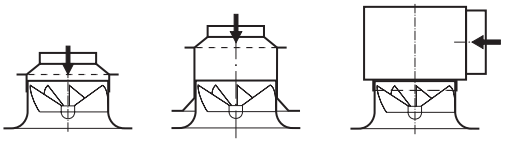


Graph 2: Minimum air outlet centre spacing

[1)] See our brochure ref. TB 69 'Layout specifications for thermal comfort'

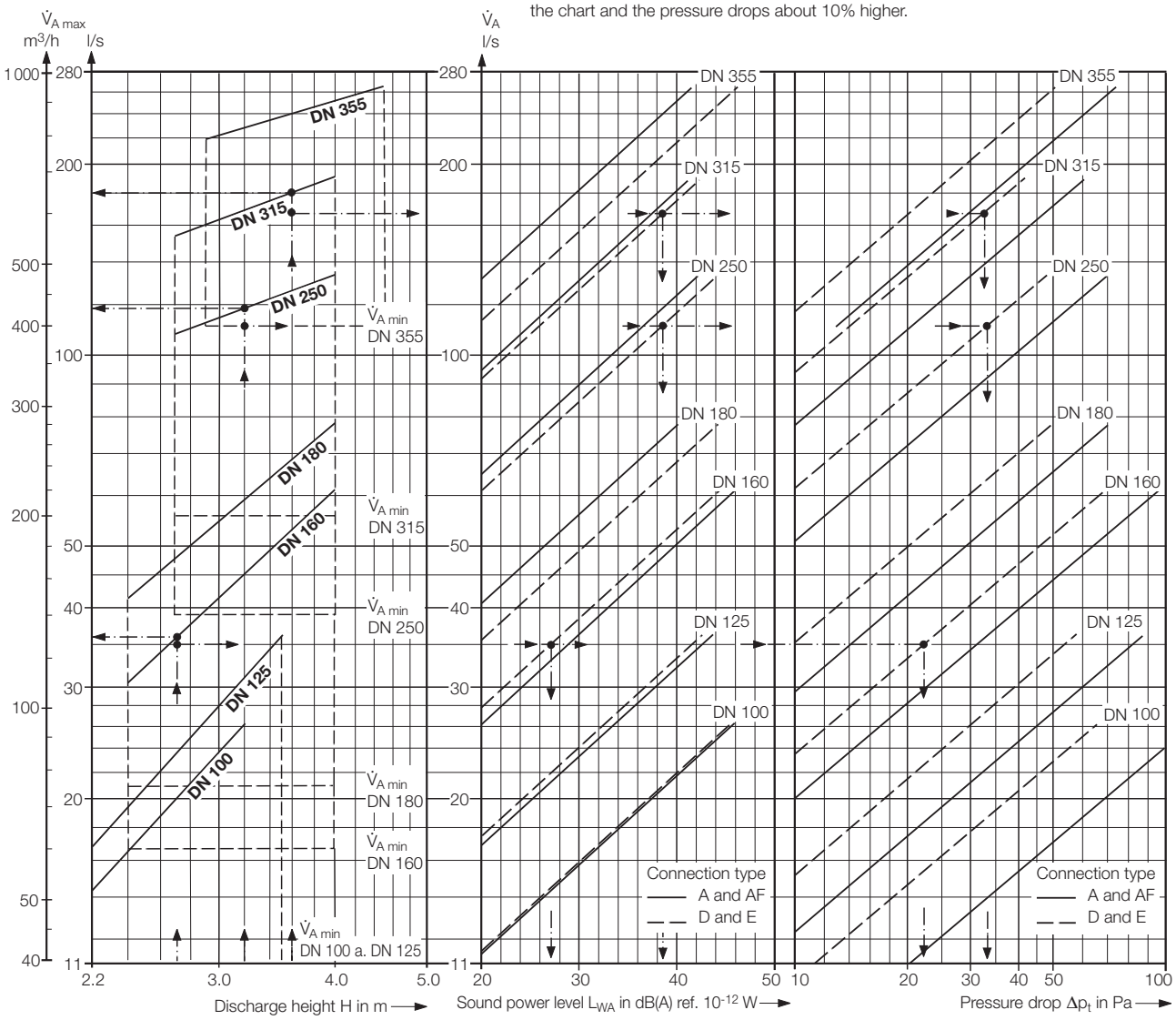
Twist outlet DN 100 – DN 355

Connection types A, AF, D and E – Nomogram



Anschlussart A **AF** **D und E**

The sound power levels for connection types A and AF apply for vertical air supply to the air outlet. The chart values for sound power level and pressure drop for connection types D and E apply for damper position 'open' and connection box without acoustic lining. With acoustic lining, the sound power levels are about 2 dB(A) lower than indicated in the chart. The pressure drop is not affected by the acoustic lining. For outlets with perforated cover screens, the sound power levels are approx. 2 to 4 dB(A) higher than indicated in the chart and the pressure drops about 10% higher.



Layout example Size (Connection type D)			**DN 160**	**DN 250**	**DN 315**
Application			Office	Bank	Department store
1 Supply air volume flow rate $\dot{V}$		l/s	2 200	5 500	
2 Discharge height	H	m	2.7	3.2	3.6
3 Floor area	A	m^2	400	1 000	1 200
4 Max. allowable sound power level L_{WA}		dB(A) ref.10^{-12} W	40		
5 Comfort criteria (see page 8)					
– Max. allowable indoor air velocity u		m/s	0.18	0.2	0.25
– Max. specific volume flow rate $\dot{V}_{Sp\,max}$ at $\Delta\vartheta_{max}$ = –12 K		l/(s•m^2)	6.5	7.8	12.5
– Actual specific volume flow rate $\dot{V}_{Sp\,tats}$ [from **1** : **3**]		l/(s•m^2)	5.5	5.5	4.6
Criterion is met if $\dot{V}_{Sp\,tats} < \dot{V}_{Sp\,max}$					

From nomogram Size			**DN 160**	**DN 250**	**DN 315**
6 $\dot{V}_{A\,max}$		l/s	36	118	168
7 Z	[$\dot{V}$: $\dot{V}_A$]	units	63	50	33
8 $\dot{V}_A$	[$\dot{V}$: Z]	l/s	35	110	165
9 L_{WA}		dB(A) ref. 10^{-12} W	≈ 27	≈ 38	≈ 38
10 Δp_t		Pa	≈ 22	≈ 32	≈ 32
11 t_{min}	[Graph 2 on page 8]	m	≈ 2.3	≈ 3.8	≈ 3.6

Twist outlet DN 100 – DN 355

Connection types A, AF, D and E – Sound power level

Size	Air outlet volume flow rate $\dot{V}_A$		Connection types A and AF: Total pressure drop [3]	Connection types A and AF: Sound power level L_W in dB ref. 10^{-12} W [1]							Connection types D and E: Total pressure drop [2+3]	Connection types D and E: Sound power level L_W in dB ref. 10^{-12} W [2]						
				L_{WA} [3]	Octave band centre frequency in Hz							L_{WA} [3]	Octave band centre frequency in Hz					
	l/s	m³/h	Δp_t in Pa	dB(A)	125	250	500	1 000	2 000	4 000	Δp_t in Pa	dB(A)	125	250	500	1 000	2 000	4 000
DN 100	11	40	21	20	15	20	20	14	—	—	12	19	27	24	16	—	—	—
	16	60	48	32	27	32	32	26	20	16	26	32	40	36	29	22	15	—
	22	80	84	41	36	41	41	35	29	25	47	41	49	44	36	35	29	16
	25	90	07	44	39	44	44	38	32	28	59	44	52	47	39	40	34	21
DN 125	16	60	19	21	19	22	21	16	—	—	12	18	27	24	16	—	—	—
	22	80	33	29	27	29	29	24	—	—	21	27	36	32	25	16	—	—
	28	100	52	35	33	34	35	31	20	—	33	34	43	39	31	26	19	—
	33	120	70	41	38	39	41	36	29	20	48	40	48	43	36	34	28	15
DN 160	28	100	18	22	21	23	23	14	—	—	14	20	28	25	17	—	—	—
	33	120	28	28	25	28	28	22	12	—	20	26	34	31	23	13	—	—
	39	140	39	32	29	31	32	26	19	—	28	30	39	35	28	21	13	—
	45	160	50	36	32	34	35	31	25	—	36	35	43	39	31	27	20	—
	50	180	64	40	34	37	38	36	30	20	46	38	47	42	35	32	25	13
DN 180	50	180	30	27	24	25	25	24	16	—	20	30	39	35	28	21	13	—
	55	200	36	30	27	28	28	27	19	—	25	34	43	38	31	25	18	—
	60	220	44	33	30	31	31	30	22	13	30	37	45	41	33	30	23	11
	66	240	52	35	33	34	34	32	24	14	36	40	48	43	36	33	27	15
	72	260	60	38	35	36	36	35	27	18	42	42	50	45	38	37	31	18
DN 250	70	250	18	23	27	23	21	18	12	—	13	23	29	28	21	15	—	—
	83	300	27	28	31	28	26	24	14	—	18	29	35	33	27	22	13	—
	97	350	37	32	35	31	30	29	20	—	25	34	39	37	31	28	20	—
	110	400	49	36	38	34	33	33	25	16	32	38	42	41	35	33	25	14
	125	450	61	40	41	37	36	37	30	23	41	42	45	44	39	38	30	19
DN 315	125	450	27	29	30	29	28	25	15	—	18	29	35	33	27	22	13	—
	140	500	33	32	33	32	31	38	18	—	23	32	38	36	30	27	18	—
	153	550	40	35	36	35	34	31	21	13	27	35	40	39	33	30	22	—
	165	600	47	37	38	37	36	33	23	15	33	38	42	41	35	33	25	14
	180	650	56	40	41	40	39	36	26	18	38	41	44	43	38	36	29	17
DN 355	165	600	29	28	32	31	27	21	—	—	20	32	37	36	29	26	17	—
	195	700	40	32	35	34	31	26	17	—	27	37	41	40	34	32	23	12
	220	800	51	36	38	37	35	32	23	16	36	41	44	43	38	36	29	17
	250	900	65	40	41	40	39	36	28	23	45	44	47	46	41	41	33	22
	265	950	72	42	42	42	40	39	31	26	50	46	48	47	43	43	36	24

[1] Values apply for vertical air supply to the air outlet. They are higher for connection to flexible duct and 90° elbow.

[2] Applies for damper position 'open' and connection box without acoustic lining. With lining, the values are lower by about 2 dB(A) ref. 10^{-12} W. The pressure drop is not affected by the acoustic lining.

[3] For outlets with perforated cover screens, the sound power levels are higher than in the table by approx. 2 to 4 dB(A) ref. 10^{-12} W and the pressure drop values are higher by about 10%.

Insertion loss in dB						
Size	Connection box **without** acoustic lining Octave band centre frequency in Hz					
DN	125	250	500	1 000	2 000	4 000
100	3	2	1	6	8	7
125	3	2	1	5	6	8
160	2	2	1	3	4	7
180	3	2	1	6	3	5
250	4	2	5	4	4	4
315	4	2	6	6	4	4
355	4	2	3	4	3	3

Insertion loss in dB						
Size	Connection box **with** acoustic lining Octave band centre frequency in Hz					
DN	125	250	500	1 000	2 000	4 000
100	3	2	3	7	10	10
125	3	2	2	6	10	11
160	3	2	3	7	8	8
180	3	2	3	9	7	6
250	4	2	6	7	6	8
315	4	2	7	7	5	6
355	4	2	7	7	4	5

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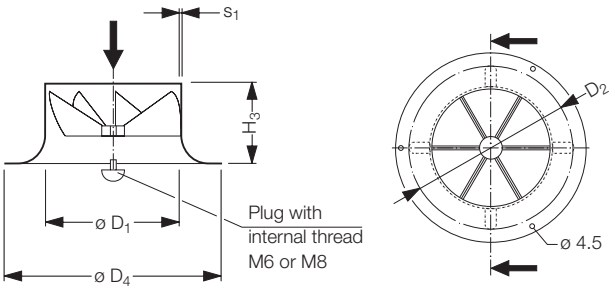
Single twist outlet element

Dimensions and sound power level – nomogram



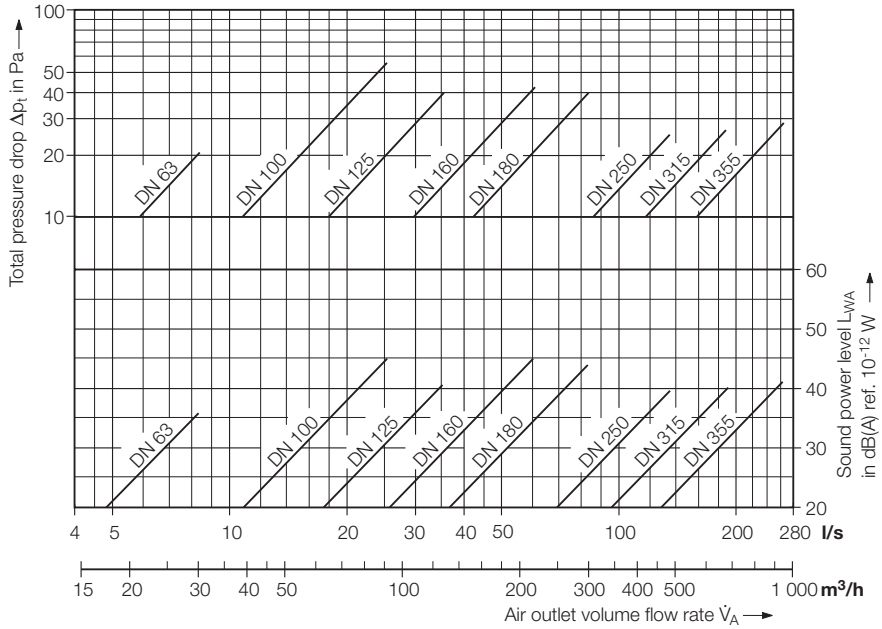
Nom. ø DN	Material of twist outlet	D_1 mm	D_2 [2] mm	D_4 mm	H_3 mm	s_1 mm	Plug internal thread	Min.[1] volume flow rate l/s	Min.[1] volume flow rate m^3/h
63	Polystyrene	62	81	110	32	2.0	M6	2	8
100	Polystyrene	99	137	165	44	2.0		11	40
125	Polystyrene	124	172	200	73	2.0		11	40
160	Polystyrene	159	222	250	74	2.0		16	60
180	Polystyrene	179	247	280	102	2.0		21	75
250	Polystyrene	249	339	380	130	2.0	M8	39	140
	Aluminium		300		105	1.5			
315	Polystyrene	314	434	490	170	2.0		55	200
	Aluminium		378		133	1.5			
355	Aluminium	354	426	550	148	1.5		110	400

[1] The maximum volume flow rate depends on the discharge height, see nomogram (page 9)

[2] Ceiling cutout

Size	Air outlet volume flow rate $\dot{V}_A$		Total pressure drop Δp_t	Sound power level L_W in dB ref. 10^{-12} W						
				L_{WA}	Octave band centre frequency in Hz					
DN	l/s	m^3/h	Pa	dB(A)	125	250	500	1000	2000	4000
63	4	15	5	16	10	13	16	12	—	—
		20	9	24	17	19	24	20	—	—
	5.5	30	21	35	29	28	34	32	21	12
	8									
100	14	50	17	27	26	28	27	23	12	—
	21	75	38	38	35	37	36	35	27	21
	25	90	55	43	39	42	41	40	34	28
125	16	60	9	19	25	21	18	15	—	—
	25	90	20	30	35	31	28	26	15	—
	33	120	36	38	42	39	36	34	27	19
160	30	110	11	24	29	27	24	15	—	—
	40	145	19	32	35	34	31	25	18	—
	55	200	37	42	42	42	40	38	31	24
180	45	160	11	25	27	27	25	15	—	—
	55	200	18	32	35	33	31	24	20	—
	66	240	26	37	41	38	37	31	28	18
250	78	280	9	23	27	24	23	15	—	—
	95	340	13	29	31	30	29	22	16	—
	110	400	17	34	35	34	33	28	23	—
315	105	380	8	21	26	21	21	15	—	—
	128	460	12	27	31	27	26	22	12	—
	150	540	17	32	35	32	31	28	19	—
355	140	500	8	21	26	23	21	16	—	—
	165	600	11	27	31	28	26	23	11	—
	195	700	15	32	34	32	31	28	18	—

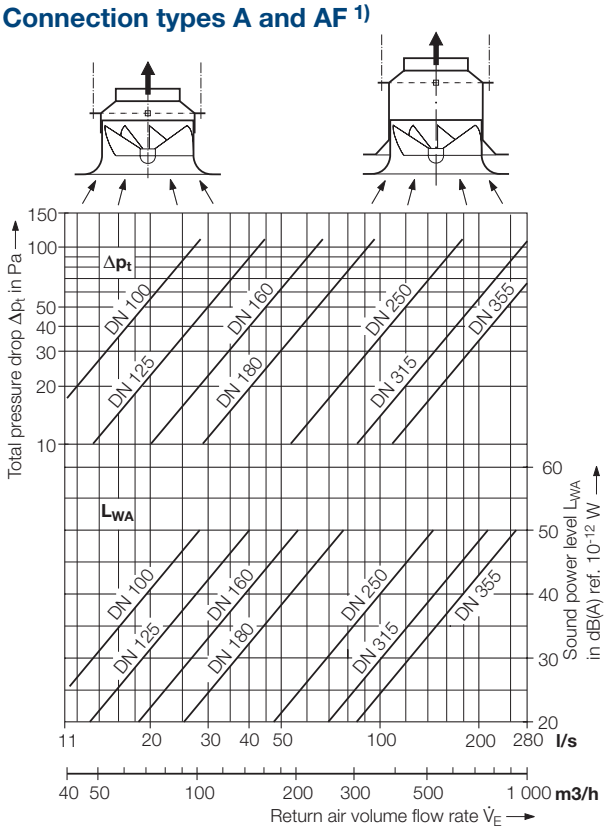
Note:
The chart and table values apply for axial air supply to twist outlets with plugs.
Single twist outlet elements are also available with perforated cover screens (for dimensions see page 6).
With perforated cover screen, the sound power levels are higher than indicated here by approx. 2 to 4 dB(A) ref. 10^{-12} W and the pressure drops about 10% higher.



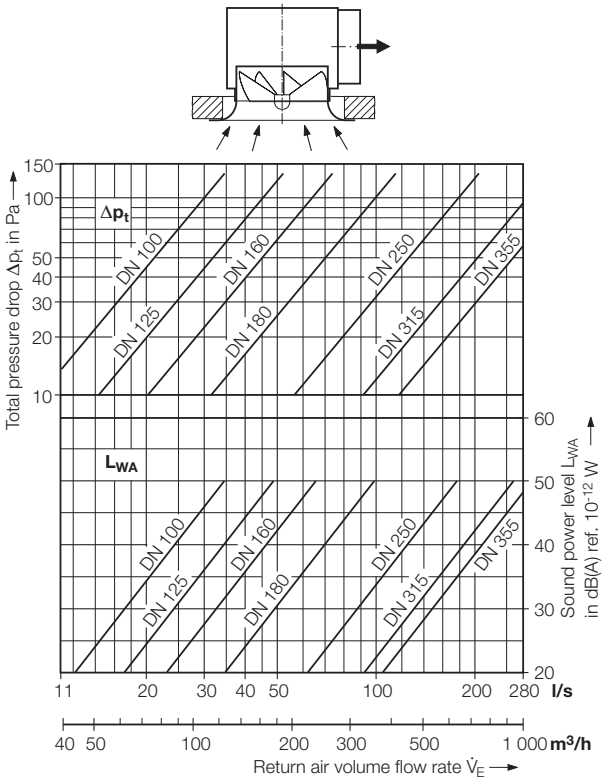
Twist outlet as return air inlet

and return air inlet with perforated cover screen

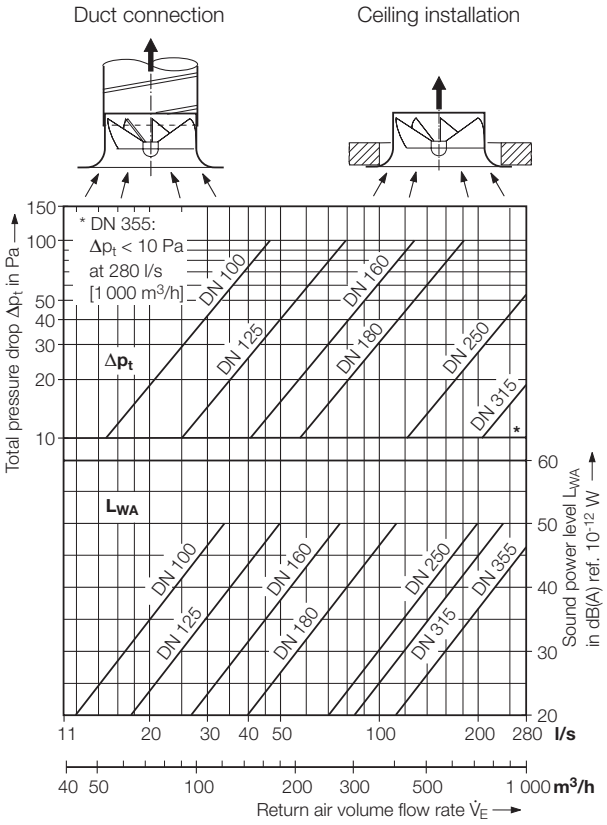
Connection types A and AF [1)]



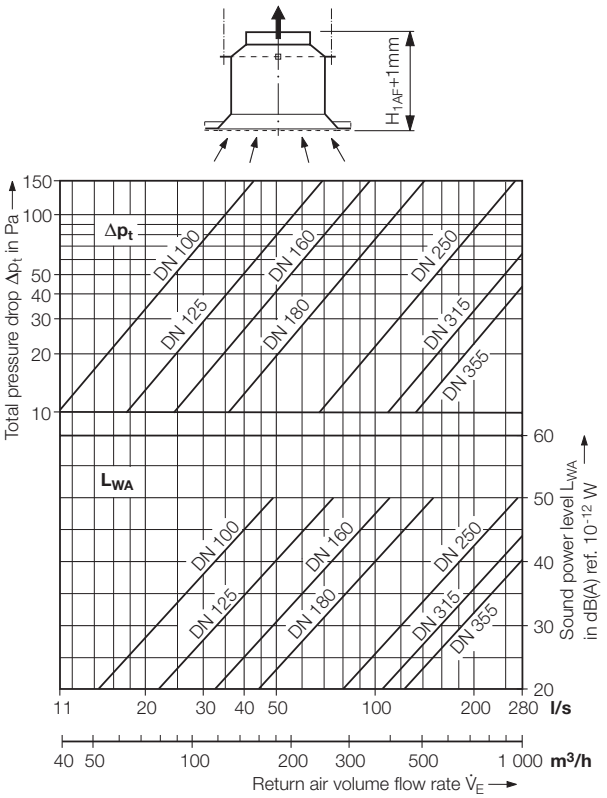
Connection types D and E [1)]



Single element [2)]



Return air inlet with perforated cover screen [3)]



Dimensions as for application as supply air outlet: [1)] Pages 6 and 7; [2)] Page 11; [3)] Page 6, type AF

Twist outlet

Type code – as supply air outlet

DD-N _ – DN ___ – __ __ __ – __ – ___ – _

Material
K = Plastic
A = Aluminium

Size

	Plastic	Aluminium
63 = DN 63	•	
100 = DN 100	•	
125 = DN 125	•	
160 = DN 160	•	
180 = DN 180	•	
250 = DN 250	•	•
315 = DN 315	•	•
355 = DN 355		•

Connection type
O = no connection piece (only discharge element)
A = reducer (connection type A)
AF = reducer with support flange (connection type AF)
D = connection box (connection type D), external sleeve
E = connection box (connection type E), outlet flush with connection box
L = perforated hood [2)]

Damper
O = no volume flow damper
R = with volume flow damper adjustable from room
S = with volume flow damper adjustable at spigot [1)]

Insulation
O = without acoustic lining
I = with acoustic lining

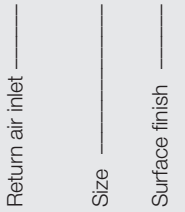
Painting
P = powder-coated (for the aluminium type)
N = wet painted (for the plastic type)
E = body tinted (only for the plastic type)

Surface finish
9010= face painted to RAL 9010, semi-matt
7038= face painted to RAL 7038, semi-matt
…. = face painted to RAL …

Accessories
O = none
L = perforated cover

– as return air inlet

DA-L – DN ___ – ___



Size:
100 = DN 100
125 = DN 125
160 = DN 160
180 = DN 180
250 = DN 250
315 = DN 315
355 = DN 355

Surface finish
9010= face painted to RAL 9010, semi-matt
7038= face painted to RAL 7038, semi-matt
…. = face painted to RAL …

[1)] Available for connection box of type E
[2)] Perforated hood for supply air to increase pressure upon request

Twist outlet

Tender text
– Supply air outlet

... units – Twist outlet with high induction effect for diffuse air flow in room at minimum temperature gradients in the occupied zone,

consisting of:
- twist outlet element with spigot, circular face and twist vanes, optionally fitted with perforated cover screen for visually plane ceiling surface,
  duct connection via reducer with lateral L-suspensions or reducer with support flange for placement on false ceiling and with lateral L-suspensions, each type of reducer with central fastener for air outlet, or connection via flat connection box with connection spigot and central fastener for air outlet, including flange bores for suspension, with optional volume flow damper adjustable from room or – for connection type E – adjustable at spigot, box optionally fitted with acoustic lining.

Material:
- Twist outlet element made of polystyrene, body-tinted to RAL 7038, agate grey, or wet painted to RAL 9010, pure white [2)]
- Twist outlet element made of aluminium in natural colour or powder-coated to RAL 9010, pure white [2 + 3)]
- Perforated cover screen made of aluminium, powder-coated to RAL 9010, pure white [2)]
- Reducer made of aluminium
- Reducer made of aluminium with support flange
- Connection box made of galvanized sheet metal

Make: Krantz Components
Type: DD-N _ – DN ___ – __ __ __ – __ – ___ – _

– Return air inlet with perforated cover screen [1)]

... units – Return air inlet with perforated cover screen

consisting of:
- perforated cover screen with circular face, reducer with flange and lateral L-suspensions, including central fastener for perforated cover screen.

Material:
- Perforated cover screen made of aluminium, powder-coated to RAL 9010, pure white
- Reducer made of aluminium with support flange

Make: Krantz Components
Type: DA-L – DN ___ – ___

Subject to technical alterations.

[1)] Applies for return air inlet with perforated cover screen, see page 12. Where supply air outlets are used as return air inlets, the tender text is the same as for supply air outlets.

[2)] Other colours on request

[3)] Only sizes DN 250, DN 315 and DN 355 available

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