

Please note,
type code is new,
see last page.

Technical Selection



- Variable twist outlet with**
- guide ring DD-VL....
 - jet straightener DD-VG....

DS 4033 E 03.2007

Preliminary remarks

The variable twist outlet with guide ring generates turbulent mixing air flow and is used for air supply where there is no significant pollutant load. It is very well suited for high rooms or halls where it is placed above the occupied zone.

The variable twist outlet with guide ring designed for duct connection has excellent acoustic properties. It can therefore be used in rooms calling for low sound pressure levels such as broadcasting studios, theatres and concert halls. If fitted with a jet straightener, this outlet can achieve large vertical penetration depths in the heating mode, at high temperature differences between supply air and indoor air. For this reason it is also eminently suitable for use in high halls such as exhibition halls and painting hangars.

Construction design and function

The air outlet mainly consists of the outer cylinder **1**, the core chamber **2**, the rounded exit **3**, and the individual twist vanes **4**. The twist vanes are fixed to the outer cylinder and the core chamber. The rounded exit is fitted with a coaxially mobile guide ring **5** whose height can be adjusted by a lift of 80 to 120 mm, depending on the outlet size. So the discharge direction of the air jets can be adjusted from horizontal (when cooling) to vertically downwards (when heating), manually or with a servomotor **6**.

The variable twist outlet with guide ring is used for discharge heights of 3 m to 10 m. A jet straightener **7** is inserted in the guide ring for discharge heights of up to 25 m.

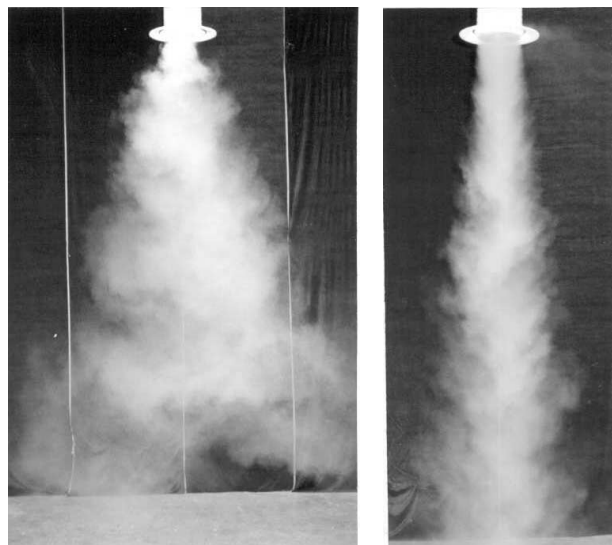
The air outlet can be connected to the duct system either directly using a circular duct, or via a connection box. It may also be connected to the bottom of a rectangular duct, using a spigot to be provided by the client (for details see page 3).

Nominal diameter		DN 315	DN 400	DN 630
Volume flow rate	l/s	170 – 550	280 – 970	830 – 2500
	m ³ /h	600 – 2000	1000 – 3500	3000 – 9000
Discharge height with				
– guide ring	m	3 – 9	4 – 10	5 – 10
– jet straightener	m	5 – 15	6 – 20	7 – 25
Max. temperature difference $\Delta\theta$ between supply air and indoor air		– 10 K when cooling + 15 K when heating, with guide ring + 20 K when heating, with jet straightener		



Variable twist outlet

Above: with guide ring; Below: with jet straightener

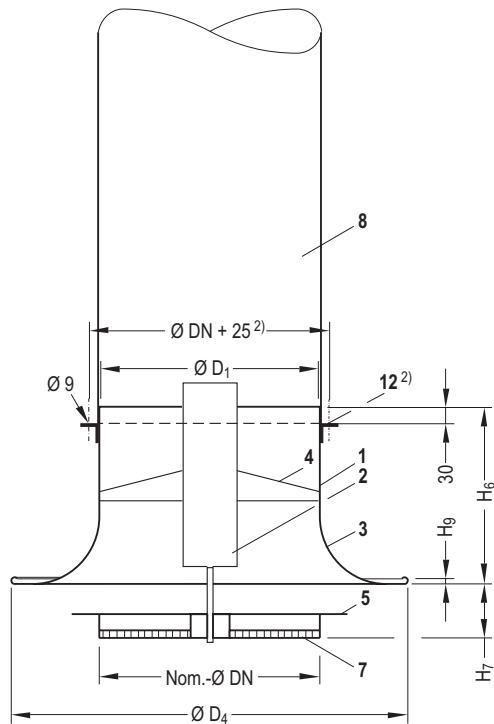


Jet dispersion made visible with smoke tracer

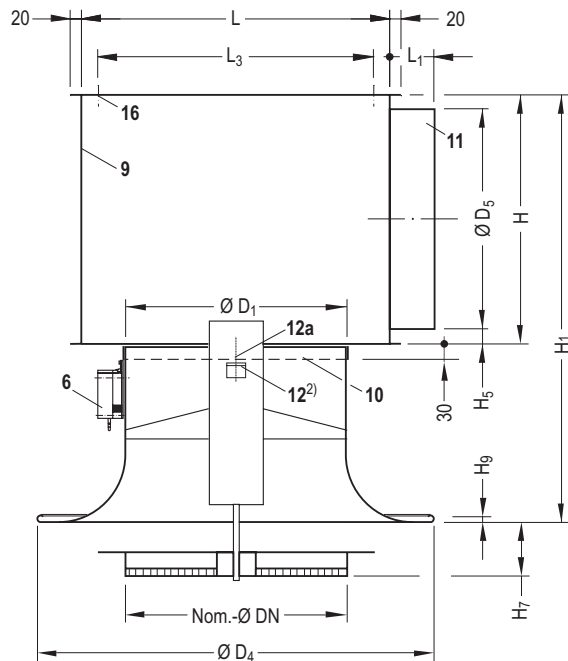
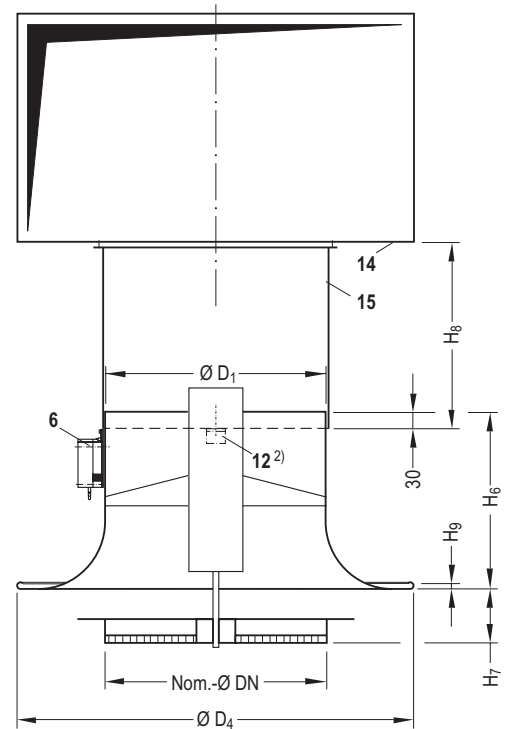
Above: cooling mode - The cool supply air is discharged horizontally and flows downwards slowly and evenly

Below: heating mode - The warm vertical supply air jets penetrate deep into the occupied zone,
left: with guide ring, right: with jet straightener

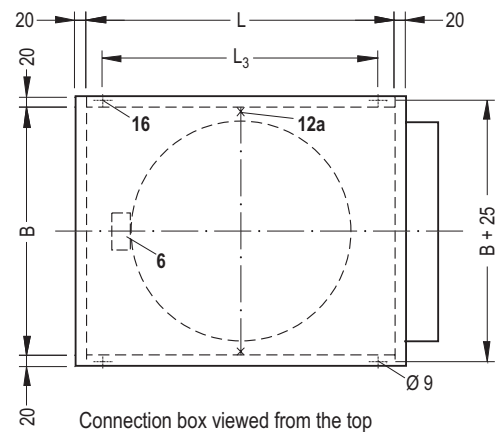
Connection to circular duct



Connection to rectangular duct with spigot



Connection to connection box



Key:

- | | |
|--------------------|--|
| 1 Outer cylinder | 9 Connection box |
| 2 Core chamber | 10 Sleeve at connection box |
| 3 Exit | 11 Connection spigot |
| 4 Twist vane | 12 L-fastener ²⁾ (on 2 sides) |
| 5 Guide ring | 12a Screw connection to box bottom |
| 6 Servomotor | 14 Rectangular duct |
| 7 Jet straightener | 15 Spigot for duct connection |
| 8 Circular duct | 16 Hole for suspension |

Size	Dimensions in mm															Weight in kg ¹⁾	
DN	L	L ₁	L ₃	B	H	H ₁	H ₅	H ₆	H _{7 max}	H _{8 min}	H ₉	Ø D ₁	Ø D ₂ ³⁾	Ø D ₄	Ø D ₅	Air outlet	With connection box
315	475	60	415	365	365	690	25	320	90	500	12	314	500	565	314	6	16,5
400	560	80	500	450	450	775	25	320	106	600	12	399	650	720	399	8	23
630	790	80	730	680	680	1185	25	500	110	950	12	628	1000	1080	628	17	42

1) Without servomotor; weight of servomotor 0.5-0.8 kg

2) In case of connection to a box and mounting flush with the ceiling, the L-fastener is positioned inside (Ø DN 30mm)

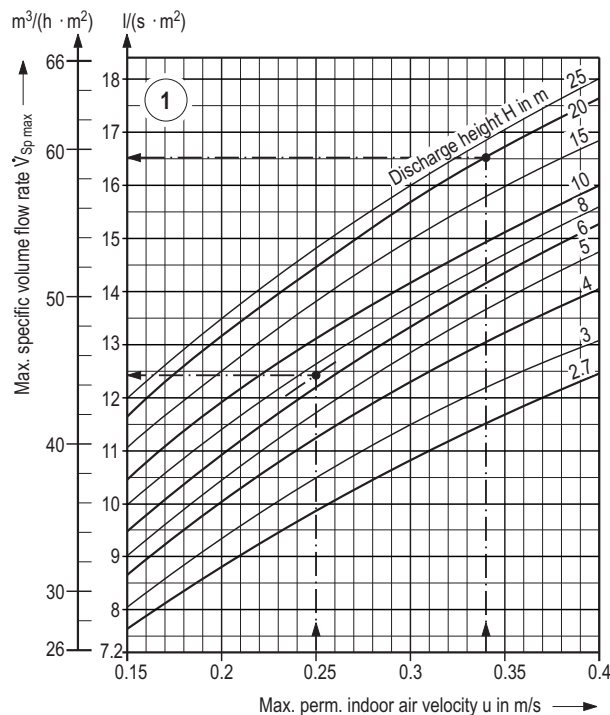
3) Ceiling cutout

Comfort criteria

The layout of the radial outlet will be based on compliance with the required maximum permissible indoor air velocities. First you have to determine the maximum specific volume flow rate $\dot{V}_{Sp \max}$ depending on the indoor air velocity u and the discharge height H as per diagram 1.

The minimum outlet centre spacing $t_{\min}$ will then be determined according to diagram 2 on the basis of the maximum specific volume flow rate and the outlet volume flow rate.

Maximum specific volume flow rate

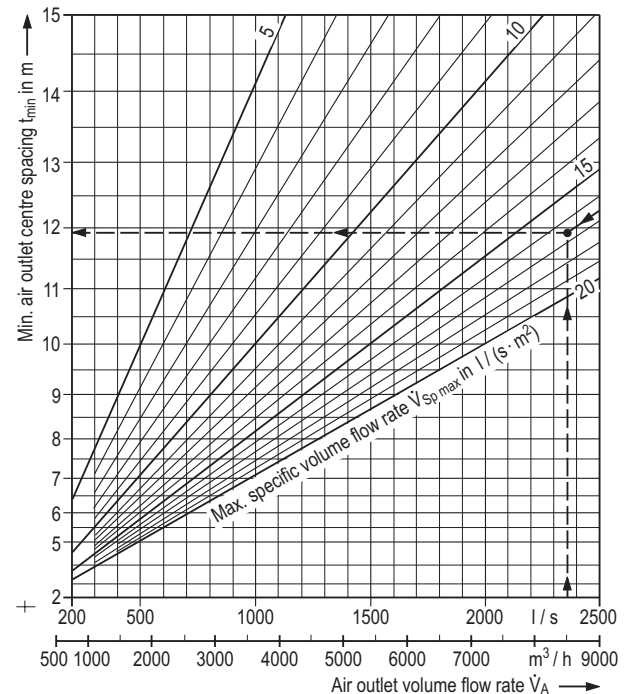
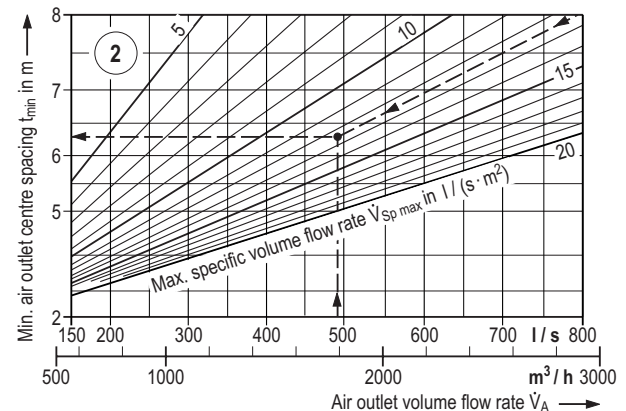


Layout example		Assembly shop for electrical equipment	Aircraft painting hangar
Outlet type, size		Guide ring, DN 315	Jet straightener, DN 630
Connection to		Circular duct	Circular duct
1 Supply air volume flow rate $\dot{V}$	l/s	8 890	75 000
2 Discharge height H	m	7	20
3 Floor area A	m^2	1 450	14 000
4 Max. perm. sound power level L_{WA}	$dB(A)$ ref. $10^{-12}W$	65	75
5 Max. temperature difference Supply air-Indoor air: $\Delta\vartheta_{\text{when cooling}}$ $\Delta\vartheta_{\text{when heating}}$	K	-6 7.5	-5 5
6 Max. permissible indoor air velocity u	m/s	0.25	0.34
7 Max. specific volume flow rate $\dot{V}_{Sp \max}$	$l/(s \cdot m^2)$	12.36	16.53

Key for all graphs:

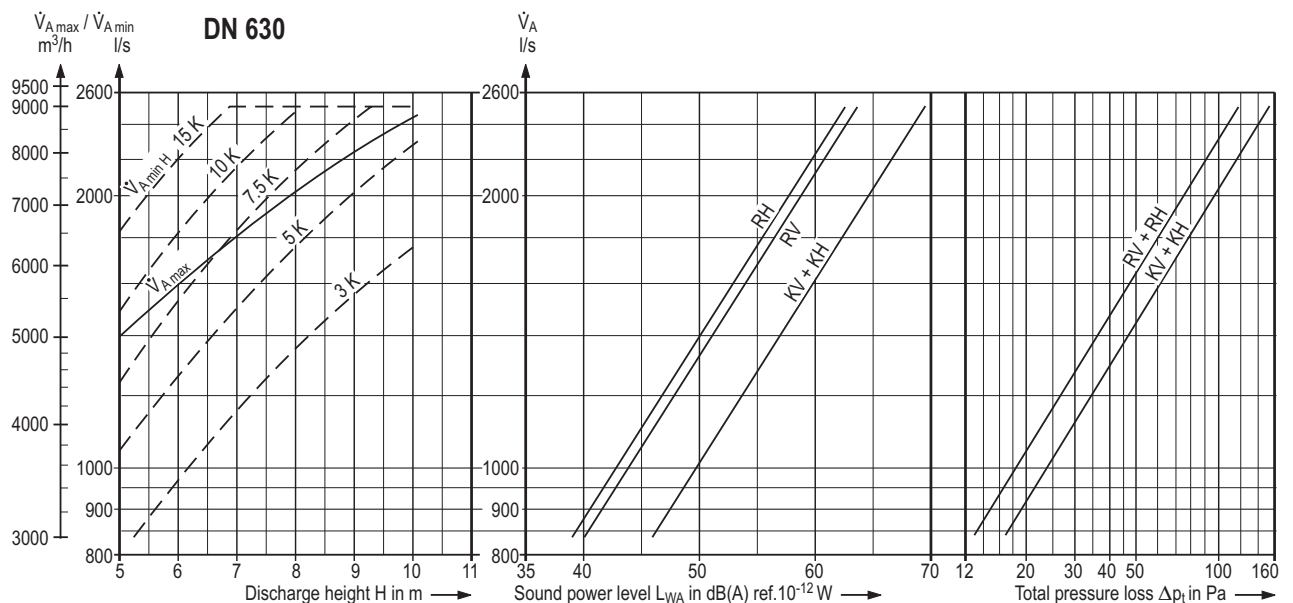
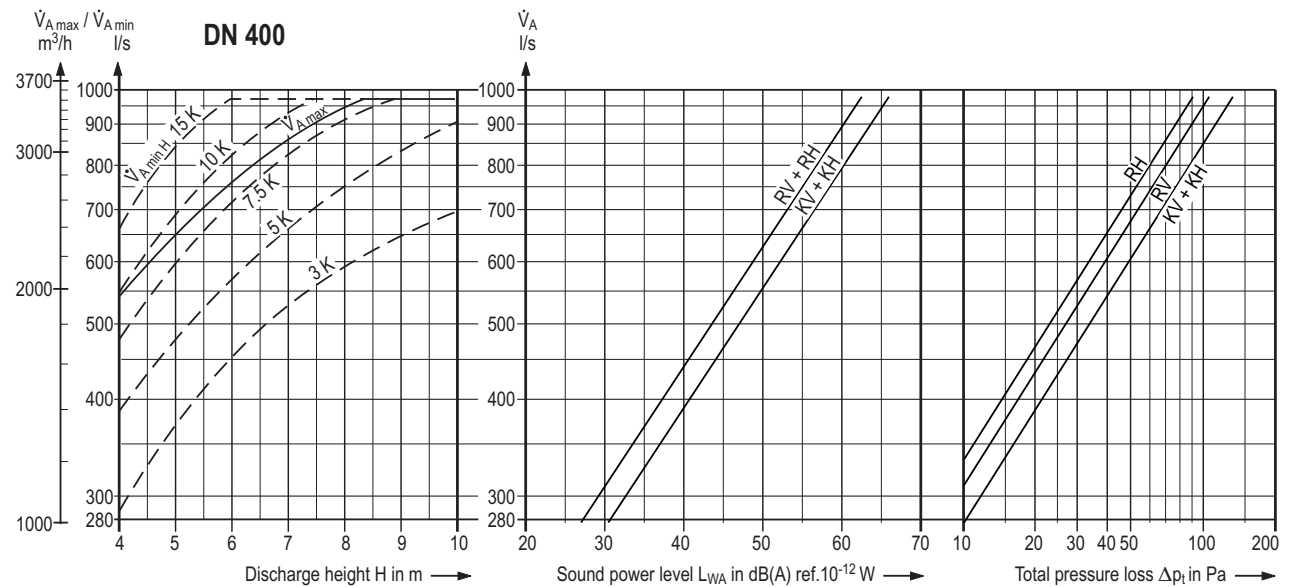
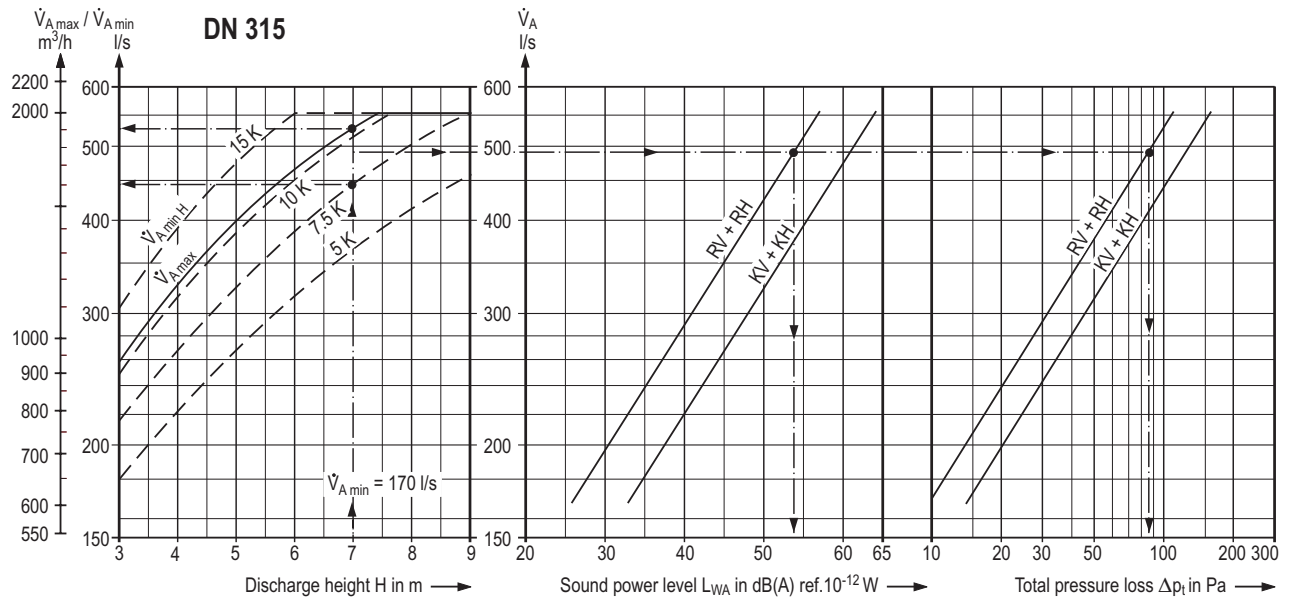
- $\dot{V}_A \max$ = Max. volume flow rate per twist outlet when cooling
- $\dot{V}_A \min$ = Min. volume flow rate per twist outlet when cooling
- $\dot{V}_A \min H$ = Min. volume flow rate per twist outlet when heating at $\Delta\vartheta = \dots K$
- $\dot{V}_A$ = Selected volume flow rate per air outlet
- $\dot{V}_{Sp \max}$ = Max. specific volume flow rate per m^2 of floor area
- u = Max. permissible indoor air velocity
- $t_{\min}$ = Minimum air outlet centre spacing
- RV = Duct connection, vertical discharge
- RH = Duct connection, horizontal discharge
- KV = Box connection, vertical discharge
- KH = Box connection, horizontal discharge

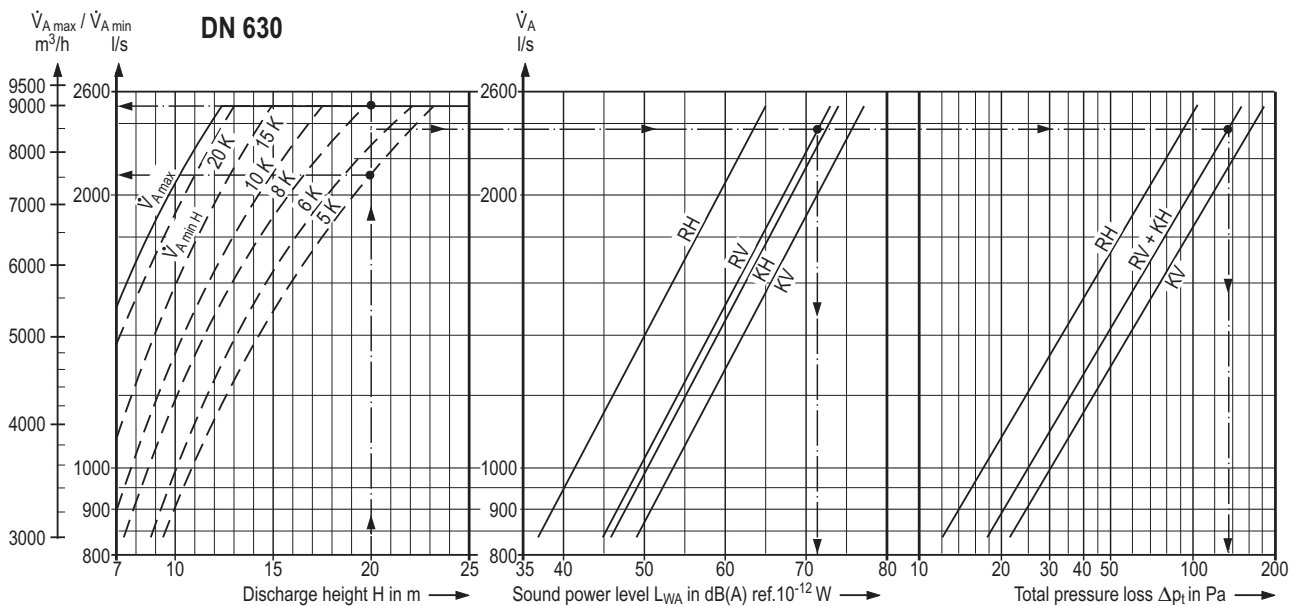
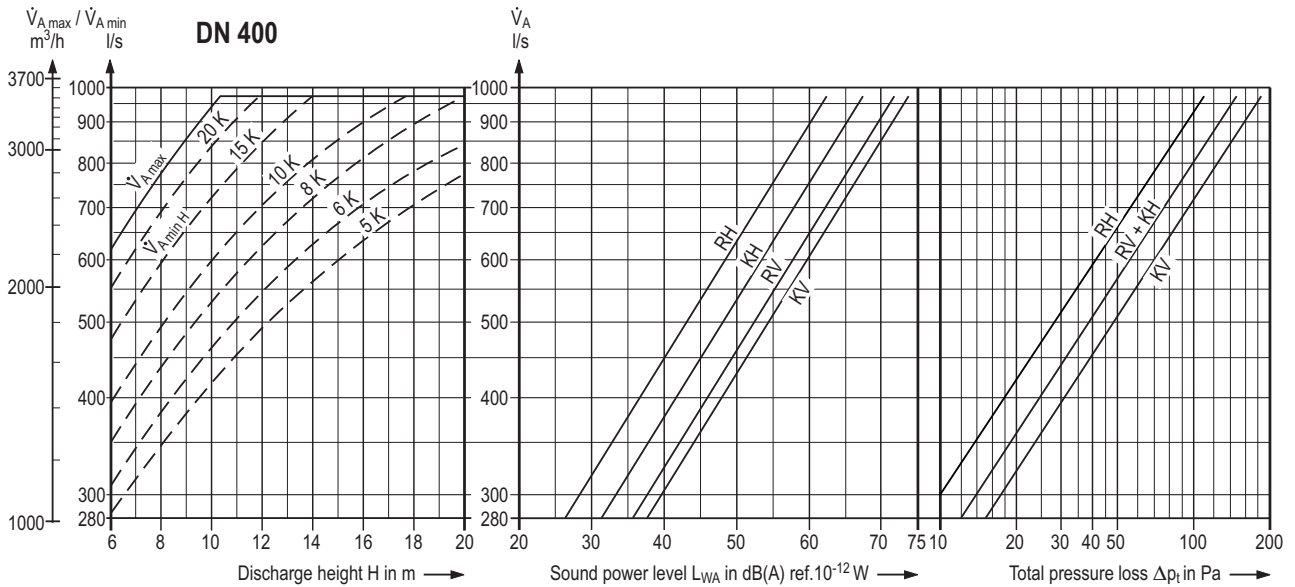
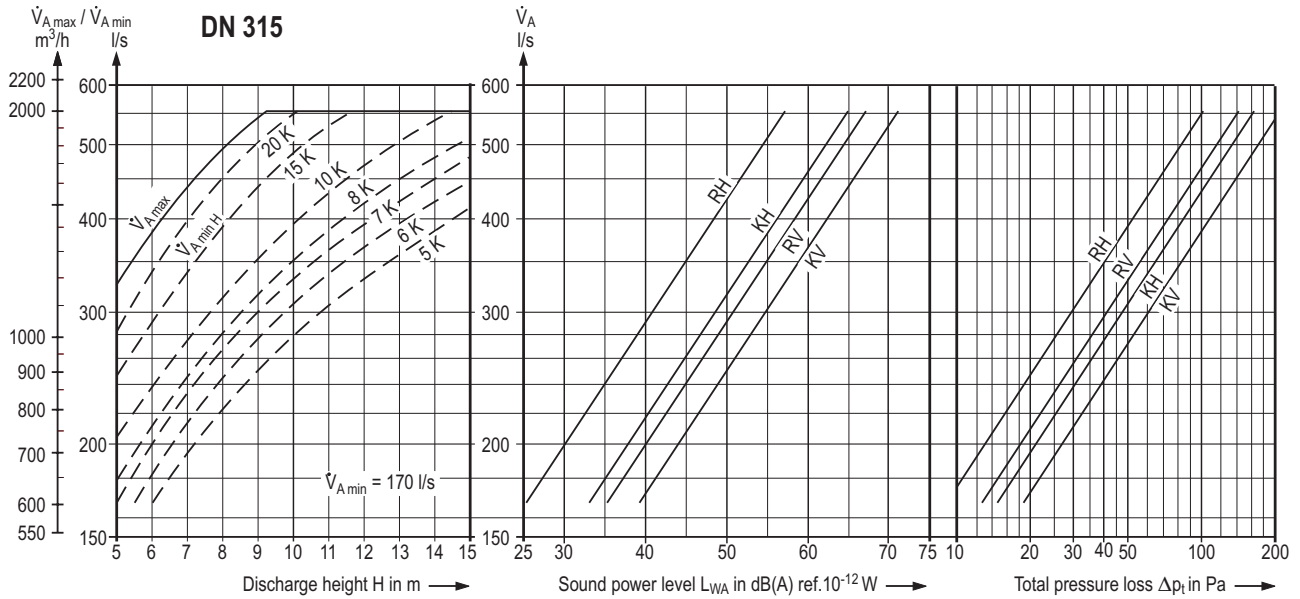
Minimum air outlet centre spacing



From nomogram:

8 $\dot{V}_A \max$	l/s	528	2 500
9 $\dot{V}_A \min H$	l/s	444	2 111
		[at $\Delta\vartheta=7.5K$]	[at $\Delta\vartheta = 5K$]
10 $\dot{V}_A$ selected	l/s	492	2 361
11 Z [from 1 : 10]	units	18	32
12 $L_{WA} \max$	$dB(A)$ ref. $10^{-12}W$	≈ 54	≈ 71
13 $\Delta p_{t \max}$	Pa	≈ 85	132
14 $t_{\min}$	m	≈ 6.3	≈ 12





Air outlet volume flow rate V̇ _A		Duct connection	Total pressure loss Δp _t Pa	Sound power level L _W in dB ref. 10 ⁻¹² W								Connection box	Total pressure loss Δp _t Pa	Sound power level L _W in dB ref. 10 ⁻¹² W									
l/s	m ³ /h			L _{WA} dB(A)	Octave band centre frequency in Hz									L _{WA} dB(A)	Octave band centre frequency in Hz								
					125	250	500	1 K	2 K	4 K	8 K				125	250	500	1 K	2 K	4 K	8 K		
Variable twist outlet with guide ring DN 315																							
280	1 000	RH RV	27 27	39 39	44 40	37 43	35 36	33 32	32 31	16 21	<15 <15	KH KV	40 40	46 46	49 48	40 42	43 43	42 42	37 37	28 29	18 19		
415	1 500	RH RV	60 60	49 49	54 47	49 51	46 48	42 40	41 40	35 36	23 30	KH KV	90 90	57 57	60 56	53 54	54 56	52 50	48 47	43 43	31 34		
555	2 000	RH RV	115 115	57 57	62 55	57 59	54 56	50 50	49 48	43 44	30 38	KH KV	160 160	64 64	67 63	60 61	61 63	60 58	55 54	50 50	38 41		
DN 400																							
415	1 500	RH RV	7 19	38 38	37 44	32 37	38 40	36 35	22 22	<10 <10	<10 <10	KH KV	23 25	42 42	41 42	41 42	40 42	38 36	30 27	14 16	<10 <10		
555	2 000	RH RV	30 34	46 46	47 50	41 46	46 47	44 43	34 34	20 23	<10 <10	KH KV	41 44	50 50	48 49	48 50	49 50	46 45	39 38	26 28	<15 <15		
835	3 000	RH RV	67 77	58 58	61 58	54 57	58 58	55 53	50 51	40 43	26 31	KH KV	92 98	62 62	60 59	59 62	62 62	58 57	53 52	43 45	31 33		
DN 630																							
1400	5 000	RH RV	36 36	50 51	53 53	49 50	46 47	46 45	42 46	32 37	24 28	KH KV	47 47	57 57	57 56	52 58	56 56	53 50	46 47	35 40	25 32		
1800	6 500	RH RV	61 61	56 57	59 57	55 56	51 52	50 51	49 51	42 46	32 35	KH KV	80 80	63 63	65 63	59 65	61 61	58 58	54 54	45 48	36 39		
2220	8 000	RH RV	93 93	60 61	64 60	59 61	55 56	54 55	54 55	50 53	40 43	KH KV	121 121	67 67	72 68	64 69	65 66	62 61	60 58	52 53	44 44		

Variable twist outlet with jet straightener DN 315																					
280	1 000	RH RV	25 35	39 49	42 43	38 45	36 45	33 44	32 42	21 42	<15 32	KH KV	40 50	47 53	50 49	41 46	44 49	43 49	39 45	29 43	16 35
415	1 500	RH RV	56 78	50 59	55 49	50 52	47 53	43 53	43 51	36 51	28 47	KH KV	90 118	57 63	61 57	53 56	55 59	53 58	49 55	44 54	34 51
555	2 000	RH RV	100 139	57 67	62 57	57 60	54 61	50 61	50 59	43 59	35 55	KH KV	160 208	65 71	68 65	60 64	62 67	61 66	56 63	51 62	41 59
DN 400																					
415	1 500	RH RV	20 28	38 47	37 44	33 45	37 45	34 42	25 37	<10 30	<10 14	KH KV	26 34	43 49	44 47	39 45	42 48	40 43	33 41	22 35	<15 25
555	2 000	RH RV	35 50	46 55	47 50	43 53	45 53	42 51	36 47	23 43	11 30	KH KV	47 60	52 57	52 55	47 52	51 54	48 52	41 51	30 48	18 40
835	3 000	RH RV	79 112	58 67	60 60	56 64	57 64	53 63	51 62	42 62	32 51	KH KV	104 135	63 69	64 65	57 63	63 66	58 63	54 62	47 59	39 54
DN 630																					
1400	5 000	RH RV	32 47	50 58	53 51	46 50	46 54	45 54	43 49	32 48	24 39	KH KV	47 57	59 62	58 58	59 59	58 60	54 57	47 52	39 51	31 47
1800	6 500	RH RV	54 80	56 65	59 59	52 58	54 62	50 59	49 57	42 56	33 47	KH KV	80 97	66 69	66 66	67 67	64 66	60 63	56 60	48 59	40 55
2220	8 000	RH RV	82 120	61 70	64 65	57 64	60 68	54 63	54 63	50 62	40 53	KH KV	121 147	71 74	72 72	73 73	69 71	65 68	63 66	55 65	47 61

Variable twist outlet with guide ring or jet straightener

Features

- Turbulent mixing air flow
- Volume flow rate range of 170 to 2500 l/s (600 to 9000 m³/h)
- Jet penetration depth adaptable to room height and thermal load
- Even temperature and humidity distribution throughout the room
- Discharge direction adjustable from horizontal to vertically downwards
- Adjustment manually or with servomotor
- Discharge height for outlet with guide ring: 3 to 10 m, for outlet with jet straightener: best from 5 to 25 m
- Maximum temperature difference supply air–indoor air:
 - 10 K when cooling
 - +15 K when heating, with guide ring
 - +20 K when heating, with jet straightener
- Sizes: DN 315, DN 400 and DN 630
- Low weight since entirely made from aluminium (powder-coated)
- Different connection types
- Can be fitted with ST-E temperature difference control device from KRANTZ KOMPONENTEN for optimum jet penetration depth
- Accelerated heating-up operation
- For commercial and industrial applications

Type code

DD - V _____ - DN _____ - _____
 Ceiling twist outlet _____
 Adjustable _____
 Function / Kind _____
 Size _____
 Connection type _____
 Adjustment _____

Please note,
type code is new,
see last page.

Size:
DN 315, DN 400, DN 630

Function / Kind:

L = Outlet with guide ring
G = Outlet with jet straightener
(Guide ring with air flow straightener)

Connection type

R = Duct connection or spigot at duct
K = Connection box

Adjustment

M = Manual
E = With electric servomotor

Tender text

..... units

Variable twist outlet,
for air supply from large discharge heights with high-
induction radial air jets, discharge direction adjustable
from horizontal to vertically downwards, consisting of:

outer cylinder with rounded exit and core chamber as well as twist vanes fixed between outer cylinder and core chamber,

with

- ☐ steplessly adjustable guide ring for discharge heights of 3 to 10 m,
- ☐ steplessly adjustable jet straightener, best used for discharge heights of 5 to 25 m,

- ☐ Adjustment by hand.
- ☐ Adjustment by electric servomotor.

Connection

- ☐ direct to circular duct.
- ☐ via connection box with lateral spigot, made from galvanized sheet metal.

Technical data

Volume flow rate: l/s (m^3/h)
Size: DN
Perm. sound power level: dB(A) ref. 10^{-12}W

Material: Aluminium powder-coated to RAL

Make: KRANTZ KOMPONENTEN

Type: DD – V – DN – –

– Subject to technical alteration –

Variable twist outlet with guide ring or jet straightener



Variable twist outlet with guide ring



Variable twist outlet jet straightener

Function / Kind:

- VL = variable with guide ring
VG = variable with jet straightener

Size:

DN 315, DN 400, DN 630

Connection type:

- R = Duct connection with rivet or screw connection ¹⁾
K = Connection box ¹⁾

Adjustment:

	DN 315 + DN 400	DN 630
MA = manual	•	•
E7 = „Belimo servomotor, 0-10 V modulation“, rotation drive type NM24A-SR	•	
E8 = „Belimo servomotor, 3-point drive, 24 V“, rotation drive type NM24A	•	
E9 = „Belimo servomotor, 3-point drive, 230 V“, rotation drive type NM230A	•	
E10 = „Belimo servomotor, 0-10 V modulation“, rotation drive type SM24A-SR		•
E11 = „Belimo servomotor, 3-point type, 24 V“, rotation drive type SM24A		•
E12 = „Belimo servomotor, 3-point type, 230 V“, rotation drive type SM230A		•
E13 = „Siemens servomotor, 0-10 V modulation“, rotation drive type GLB161.1E	•	
E14 = „Siemens servomotor, 3-point type, 24 V“, rotation drive type GLB131.1E	•	
E15 = „Siemens servomotor, 3-point type, 230 V“, rotation drive type GLB331.1E	•	
E19 = „Siemens servomotor, 0-10 V modulation“, rotation drive type GEB161.1E		•
E20 = „Siemens servomotor, 3-point type, 24 V“, rotation drive type GEB131.1E		•
E21 = „Siemens servomotor, 3-point type, 230 V“, rotation drive type GEB331.1E		•

Surface finish:

... = Face painted to RAL

Type code

DD-__ - DN__ - - -
 | | | | |
 Variable twist outlet | | | | |
 Function / Kind | | | | |
 | | | | |
 Size | | | | |
 | | | | |
 Connection type | | | | |
 | | | | |
 Adjustment | | | | |
 | | | | |
 Surface finish | | | | |

Subject to technical alteration.

¹⁾ L-fastener

- inside in case of box connection,
- outside in case of connection to circular duct