KOMPONENTEN ®

Applied system solutions

Jet nozzle DW-N2....
Swivel jet nozzle DW-V2....
Twist nozzle DW-V2-...-DR

Jet nozzle and twist nozzle

Preliminary remarks

To air condition large spaces where the air diffusers have to be placed in walls or gallery parapets, it is advisable to use nozzles. The supply air jet pattern depends on the nozzle size, the discharge velocity, the temperature difference between supply air and indoor air, and the discharge angle.

In many cases, the jet pattern can be well predicted with the help of the diagrams contained in this selection brochure. If the use of the spaces to be supplied with air is not yet established or if it may change, then it is advisable to use swivel jet nozzles which enable a resetting of both the discharge angle and the discharge direction and can therefore be adjusted to the prevailing loads in an optimal way.

In spaces where the supply air will be used both for heating and cooling, it is best to adjust the discharge angle to the respective cooling or heating load using an electric actuator or a self-acting thermostatic control unit.

Typical applications for jet nozzles are large spaces or halls such as exhibition halls, shopping centres, airports, multipurpose or concert halls, in which the air jet achieves long throws at low sound power levels. The throw of the swivel jet nozzle can be considerably reduced by mounting a twist element on the air intake side. The twist element is not visible from the room.

For architectural reasons, jet nozzles with and without twist element are often placed adjacent to each other in order to get unity of appearance.

A reduction of the jet penetration depth by using the twist nozzle makes sense in long and narrow rooms, for instance, if the distance to the opposite wall is too short for the use of jet nozzles.
Where high specific supply air volume flow rates per metre are required, it is advisable to combine twist nozzles and jet nozzles.

The following table gives an overview of the volume flow rate ranges correlated with the nozzle sizes.

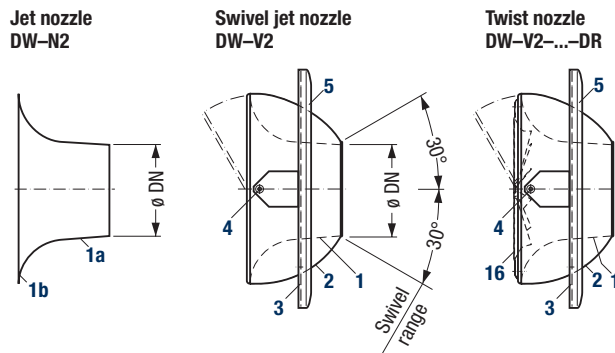| Size	Jet nozzle				Twist nozzle			
	Air volume flow rate				Air volume flow rate			
	$\dot{V}_{min}$		$\dot{V}_{max}$		$\dot{V}_{min}$		$\dot{V}_{max}$	
	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h
DN 60	11	40	33	120	—	—	—	—
DN 80	21	75	61	220	10	35	40	145
DN 120	46	165	136	490	11	80	90	325
DN 150	71	255	211	760	36	130	142	510
DN 200	125	450	378	1 360	63	225	250	900
DN 250	197	710	589	2 120	99	355	392	1 420

Jet nozzle DW–N2   Swivel jet nozzle DW–V2   Twist nozzle DW–V2–...–DR

Fig. 1: Construction design

Jet nozzle mounted in the parapet of a gallery

Jet nozzles mounted in two opposite walls

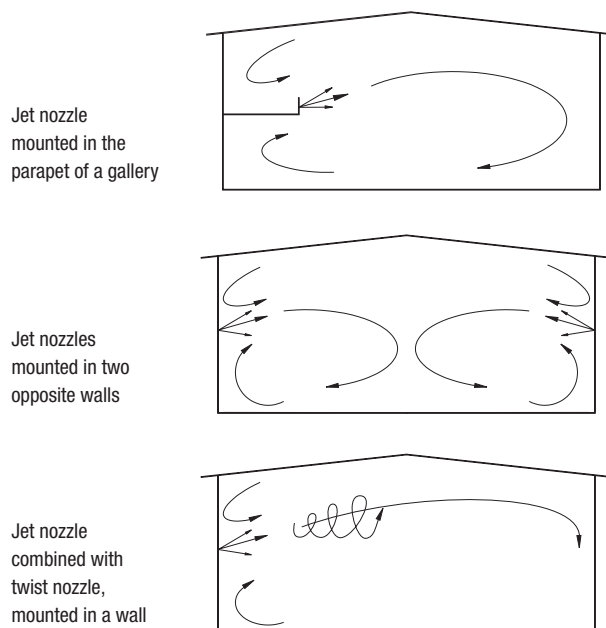Jet nozzle combined with twist nozzle, mounted in a wall

Fig. 2: Examples of arrangement

Construction design and function

Fig. 1, left, shows the non-adjustable jet nozzle DW-N2. It is made up of the nozzle body **1a**, featuring optimized air flow pattern and acoustics, with a flange **1b** on the air intake side.
Fig. 1, middle, shows the swivel jet nozzle DW-V2. Its main component is the nozzle **1** housed in the hemispheric casing **2**. This nozzle, which is linked to a fastening flange **3**, can swivel by ±30° around the horizontal swivel axis **4**. It is also possible to alter the air discharge direction sideways since the fastening flange **3** can be adjusted by ±30° in the vertical plane, which modifies the position of the swivel axis. The flange is concealed by a removable collar **5**.
As an option the swivel jet nozzle can be fitted with an electric actuator **11** or a thermostatic control unit **12** (see page 7) to enable automatic swivelling.
Fig. 1, right, shows the twist nozzle which is fitted with a twist element **16** on its intake.

Jet nozzle and twist nozzle

Specifications for layout and selection

Fig. 3: Jet dispersion with jet nozzle

Fig. 4: Jet dispersion with twist nozzle

Jet nozzle

With throws up to a maximum of 50 m and taking account of the requisite mounting height and minimum centre distances between the nozzles, the layout of jet nozzles allows for the following temperature differences between supply air and indoor air:

$\leq$ −8 K when cooling,

$\leq$ +6 K when heating.

Size	DN 60	DN 80	DN 120	DN 150	DN 200	DN 250
Min. mounting height H in m	2.5	2.8	3.2	3.5	3.9	4.2
Max. mounting height H in m	4	4	6	8	10	10
Min. nozzle centre distance [1] t_{min} in m	0.25	0.35	0.5	0.6	0.9	1.1

Twist nozzle

For short throws up to approx. 17 m twist nozzles are suitable for the following mounting heights and minimum centre distances at the following temperature differences between supply air and indoor air:

$\leq$ −8 K when cooling,

$\leq$ +6 K when heating.

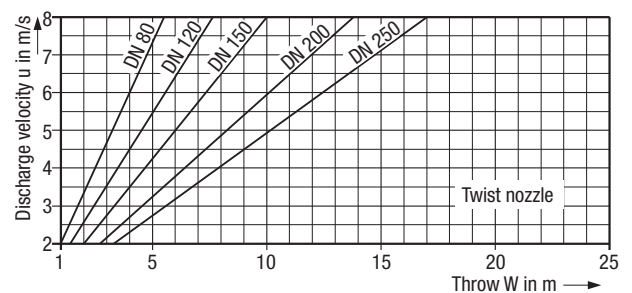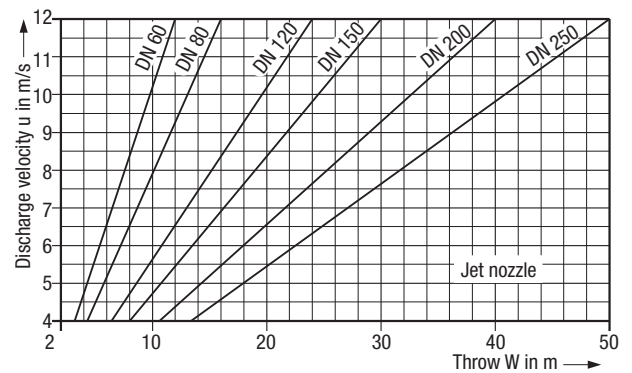| Size	DN 80	DN 120	DN 150	DN 200	DN 250
Min. mounting height H in m	2.8	3.2	3.5	3.9	4.2
Max. mounting height H in m	4	6	8	10	10
Min. nozzle centre distance [1] t_{min} in m	0.65	1.1	1.25	1.6	2.0

The graphs on pages 11 and 12 show the induction ratio, the jet deflection as well as the decrease in jet velocity and jet temperature in relation to the jet path.

The discharge direction of the swivel jet nozzle can be readjusted when tuning the HVAC system. The recommended jet angle is as follows:

– in cooling mode: 10 – 15° upwards

– in heating mode: 15 – 20° downwards

(Also see Table on page 5).

Fig. 5: Throws of jet nozzle and twist nozzle correlated with the discharge velocity

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[1] Distance recommended to comply with indoor air velocities needed for thermal comfort

Jet nozzle

Adjustment to thermal load

For electrical adjustment, the jet nozzles must be equipped with actuators. The discharge angle of the supply air will be set on the basis of the measured supply and indoor air temperatures, using the building management systems and an appropriate control graph.

Thermostatic control (available for nozzle sizes ≥ DN 120) obviates the need for a central control system and nozzle wiring. Each jet nozzle is fitted with a thermostatic control unit which gets energy for adjustment from the supply air temperature. The thermostatic control unit is filled with expandable material and works within a supply air temperature range from 20 to 28 °C (standard model). Another advantage of this control unit is that the supply air temperature is measured inside the nozzle, not at a central point such as behind the HVAC system. With extended ductwork, significant temperature differences are likely to occur and to impair both thermal comfort and heating-up periods. This is precluded by the thermostatic control unit.
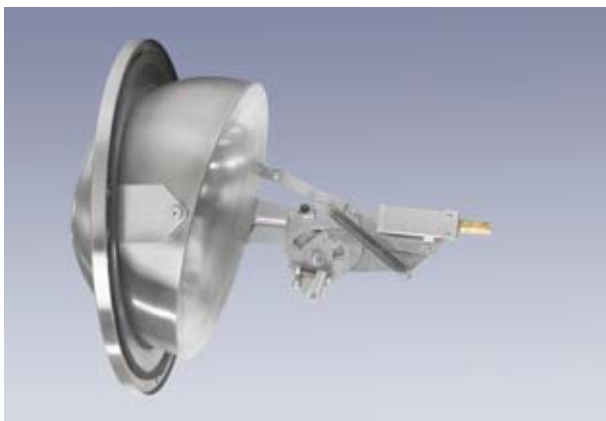

Fig 6: DW-V2 with thermostatic control unit

Connection types

a) Non-adjustable jet nozzle DW-N2

Fig. 7:
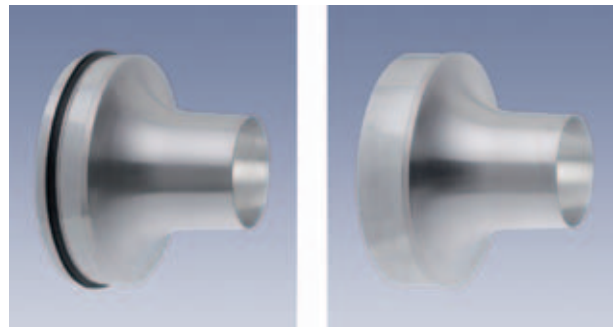DW-N2 with flange for connection to pressurized plenum or rectangular duct

Fig 8: DW-N2
Left: with push-in end and seal for circular ducts to EN 1506 (spiral seam ducts)
Right: with slip-on end for shaped parts to EN 1506

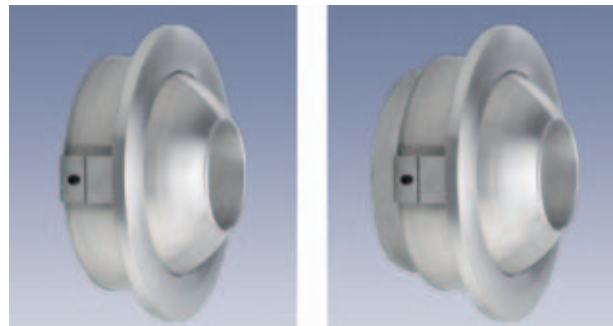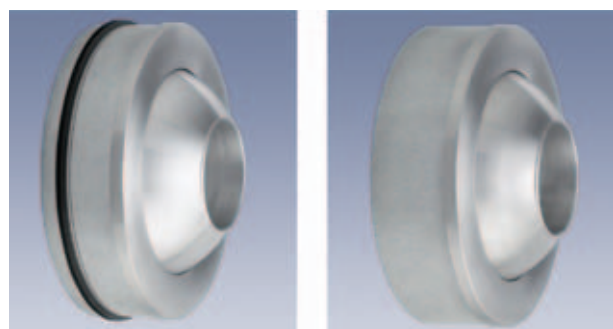**b) Swivel jet nozzle DW-V2 and twist nozzle DW-V2-...-DR**

Fig. 9: DW-V2
Left: with flange and collar for connection to pressurized plenum or rectangular duct
Right: with connector for flexible duct

Fig. 10: DW-V2
Left: with push-in end and seal for circular ducts to EN 1506 (spiral seam ducts)
Right: with slip-on end for shaped parts to EN 1506

Jet nozzle

Instructions for mounting and adjusting the nozzles [1]

1. Connection to pressurized plenum or rectangular duct, connection type K

a) Non-adjustable jet nozzle
Fasten the nozzle to the pressurized plenum or the rectangular duct using the flange **1b**.

b) Swivel jet nozzle
After removing the collar **5**, insert the jet nozzle into the duct wall cutout and fasten it with adjusting screws **6** (see sketch on page 7). By turning the fastening flange through an angle of maximum ±30°, it is possible to alter the position of the swivel axis and thus to adjust the air discharge direction sideways. A scale **7** with 10-degree division at the slot segments **3a** facilitates accurate adjustment. Then secure the nozzle at the fastening points **8**. The mounting surface should be even.

2. Insertion into circular ducts to EN 1506, connection type R

For connection type R, both the swivel and the non-adjustable jet nozzles are fitted with a push-in end **9** and a seal.

3. Connection to shaped parts to EN 1506, connection type F

For connection type F, both the swivel and the non-adjustable jet nozzles have a slip-on end **10** matching shaped parts to EN 1506.

Remark on connection types R and F:
To adjust the discharge direction sideways with swivel jet nozzles provided for connection type R or F, turn the push-in or slip-on end of the nozzle. If the relevant end is fitted with a seal, a customary lubricant can be used to help turn the nozzle, in particular with large connection diameter.
Once adjustment is completed, the nozzle should be additionally secured by screws.

4. Connection to flexible duct, connection type B
With connection type B (only for manual adjustment), the flexible duct is slipped onto the connector and the jet nozzle is set to the desired position only once. The nozzle is then fastened as described for connection type K.

5. Design with thermostatic control unit
The thermostatic control unit adjusts the angle of inclination of the swivel jet nozzle in correlation with the supply air temperature (see Fig. 6). Only the heat content of the supply air acts as driving power for the control unit; no further energy supply is needed.

In the basic setting of the swivel range, the air discharge angle of the jet nozzle is –15° to the horizontal (with the jet nozzle being mounted on a vertical surface) in heating mode at supply air temperatures > 28 ˚C. In cooling mode, if the supply air temperatures are < 20 ˚C, a discharge angle of +15° is adjusted. In between, adjustment is almost linear (see Fig. 11).
The swivel range can also be easily altered manually, even once the swivel jet nozzle is installed; this is possible in increments of 5° and up to 20° in total – see Fig. 12.
The mechanism of the thermostatic control unit is protected from undue application of force by a device that can disengage and engage again when the nozzle is swivelled by hand.

In heating mode, the supply air jet should be discharged rather flat at low nozzle mounting heights; from greater heights it should be discharged more sharply downwards. The following table shows the recommended setting parameters (angle settings of jet nozzle to the horizontal with vertical nozzle mounting).

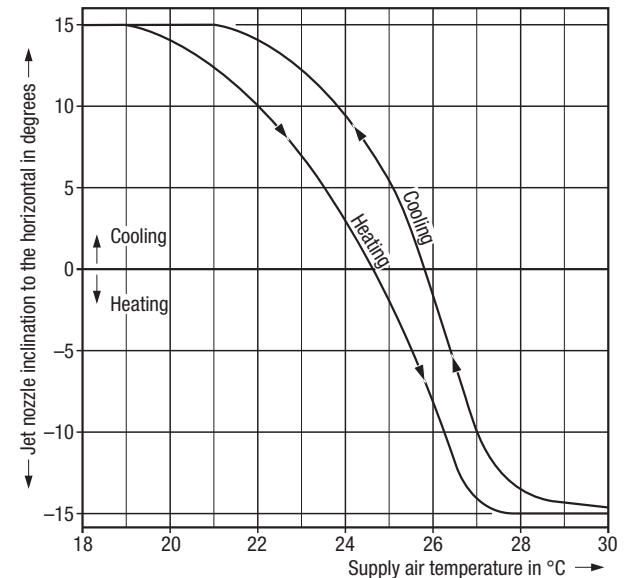| Mounting height in m	Angle of inclination in degrees	
	Cooling mode Supply air temperature ≤ 20 °C	Heating mode Supply air temperature ≥ 28 °C
< 4	+25	–5
4 – 6	+15	–15
> 6	+10	–20

Fig 11: Inclination of jet nozzle correlated with supply air temperature in basic setting ('hysteresis')
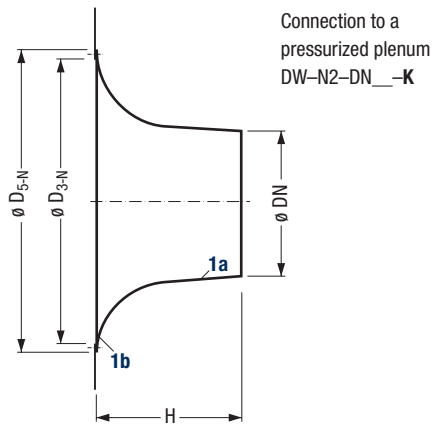

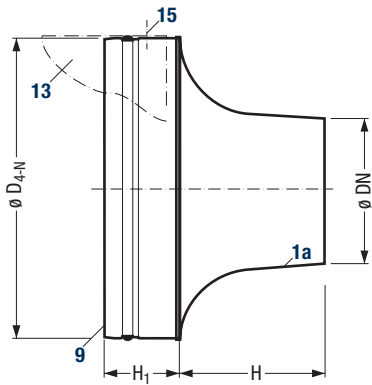**Fig 12: Subsequent alteration of discharge angle in increments of 5˚ (up to 20˚ in total)**
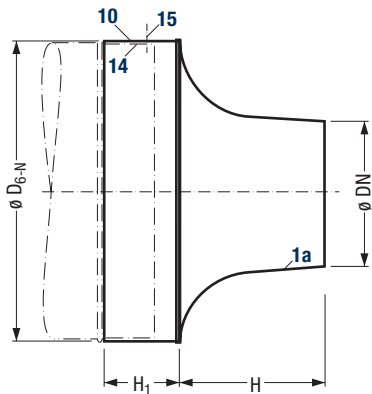
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[1] See key on page 6

Jet nozzle
Dimensions of DW-N2

Connection to a
pressurized plenum
DW–N2–DN__–**K**

Connection to a circular duct
DW–N2–DN__–**R**

Key for all pages

1 Nozzle
1a Nozzle body
1b Flange
2 Hemisphere
3 Fastening flange
3a Slot segment [2]
3b Brush seal
3c Flange seal
4 Swivel axis
5 Collar
6 Adjusting screw [2]
7 Scale of degrees [2]
8 Fastening point [2]
9 Push-in end
10 Slip-on end
11 Electric actuator
12 Thermostatic control unit
13 Connection duct
14 Shaped part
15 Locking screw
16 Twist element
17 Connector for flexible duct

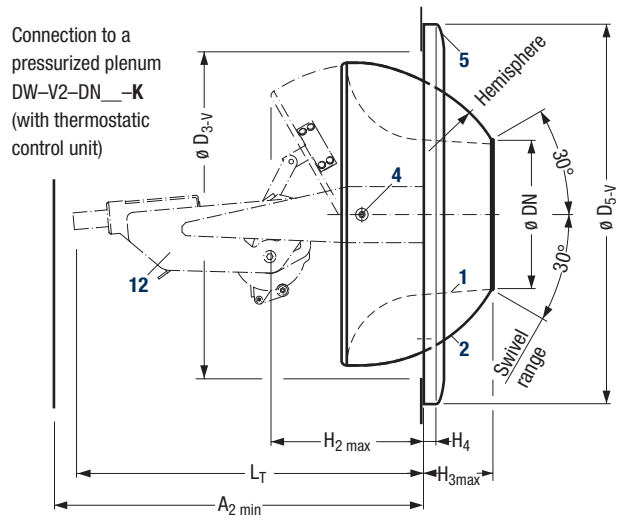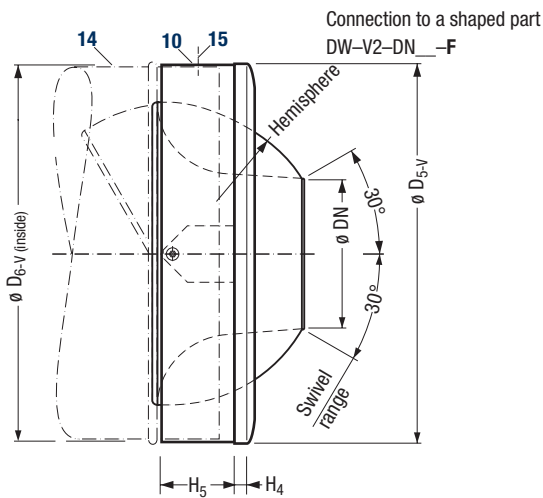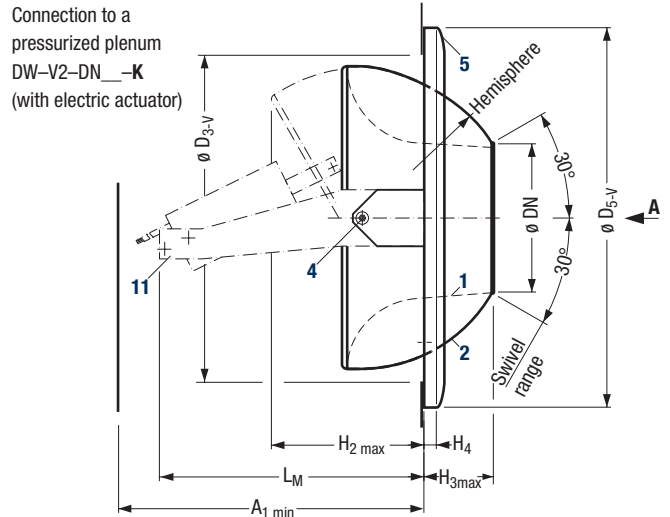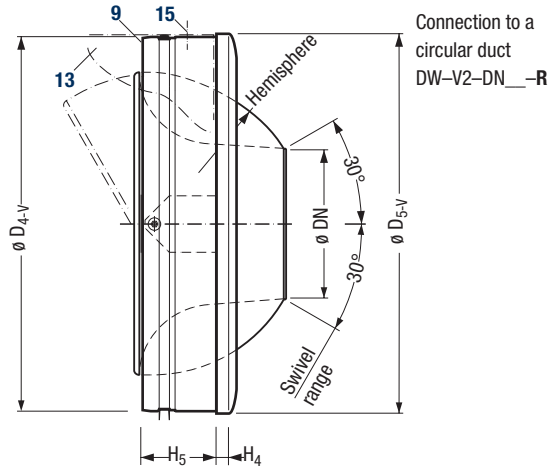Connection to a shaped part
DW–N2–DN__–**F**

Size	$\varnothing\ D_{3-N}$ [1] mm	$\varnothing\ D_{4-N}$ mm	$\varnothing\ D_{5-N}$ mm	$\varnothing\ D_{6-N}$ mm	H mm	H_1 mm	Weight in kg	
							Connection type K	Connection type R or F
DN 60	118	139	148	140	80	50	0.1	0.3
DN 80	152	179	182	180	94		0.13	0.4
DN 120	238	249	268	250	132	70	0.4	0.9
DN 150	300	314	330	315	158		0.6	1.4
DN 200	410	399	440	400	207	90	1.0	2.0
DN 250	500	499	530	500	246		1.4	2.6

[1] Wall or duct cutout

[2] Only for connection to a pressurized plenum (for swivel jet nozzle and twist nozzle)

Jet nozzle

Dimensions of DW-V2 and DW-V2-...-DR

Connection to a
circular duct
DW–V2–DN___–R

Connection to a
pressurized plenum
DW–V2–DN___–K
(with electric actuator)

Connection to a shaped part
DW–V2–DN___–F

Connection to a
pressurized plenum
DW–V2–DN___–K
(with thermostatic
control unit)

Connection to a flexible duct [4]
DW–V2–DN___–B

Section B - B

View A:
Collar 5 removed
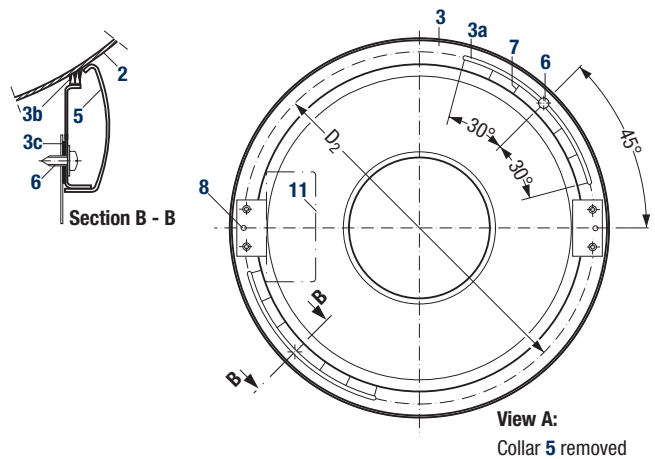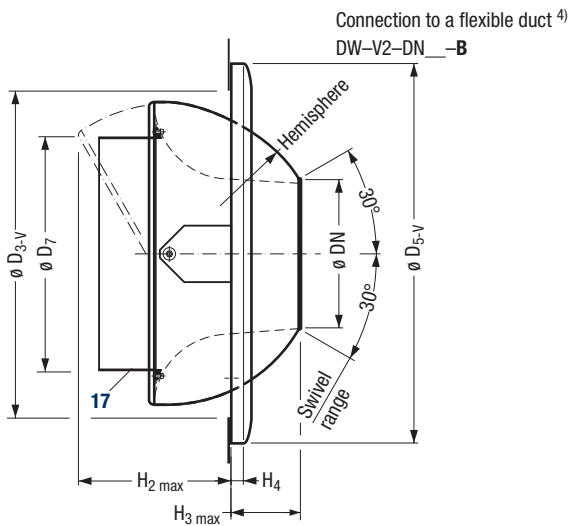
| Size	Swivel jet nozzle DW-V2 and twist nozzle DW-V2-...-DR [3]														DW-V2	DW-V2-...-DR
	ø D_2 mm	ø D_{3-V} [1] mm	ø D_{4-V} mm	ø D_{5-V} mm	ø D_{6-V} mm	$H_{2\,max}$ mm	$H_{3\,max}$ mm	H_4 mm	H_5 mm	$A_{1\,min}$ mm	$A_{2\,min}$ mm	L_M [3] mm	L_T mm	W [2] kg	ø D_7 mm	ø D_7 mm
DN 60	168	155	179	186	180	79	44	12	50	315	—	238	—	1.0	99	—
DN 80	207	188	223	230	224	94	55	14	50	321	—	244	—	1.3	139	124
DN 120	295	274	314	321	315	135	78	15	70	335	390	258	367	2.6	223	199
DN 150	376	350	399	406	400	165	96	15	70	346	405	269	381	3.9	279	249
DN 200	476	453	499	506	500	206	130	22	90	364	420	287	396	5.4	354	314
DN 250	571	543	599	606	600	261	150	22	90	389	450	312	424	7.0	449	399

[1] Wall or duct cutout   [2] Weight without actuator; actuator weight = approx. 0.9 kg   [3] Twist nozzle available in DN 80 and over   [4] Only for manual adjustment
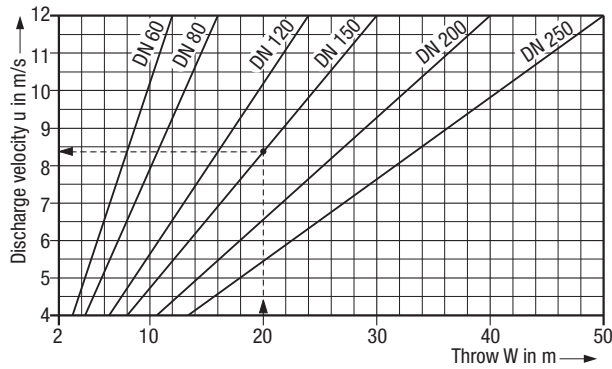
7

Jet nozzle

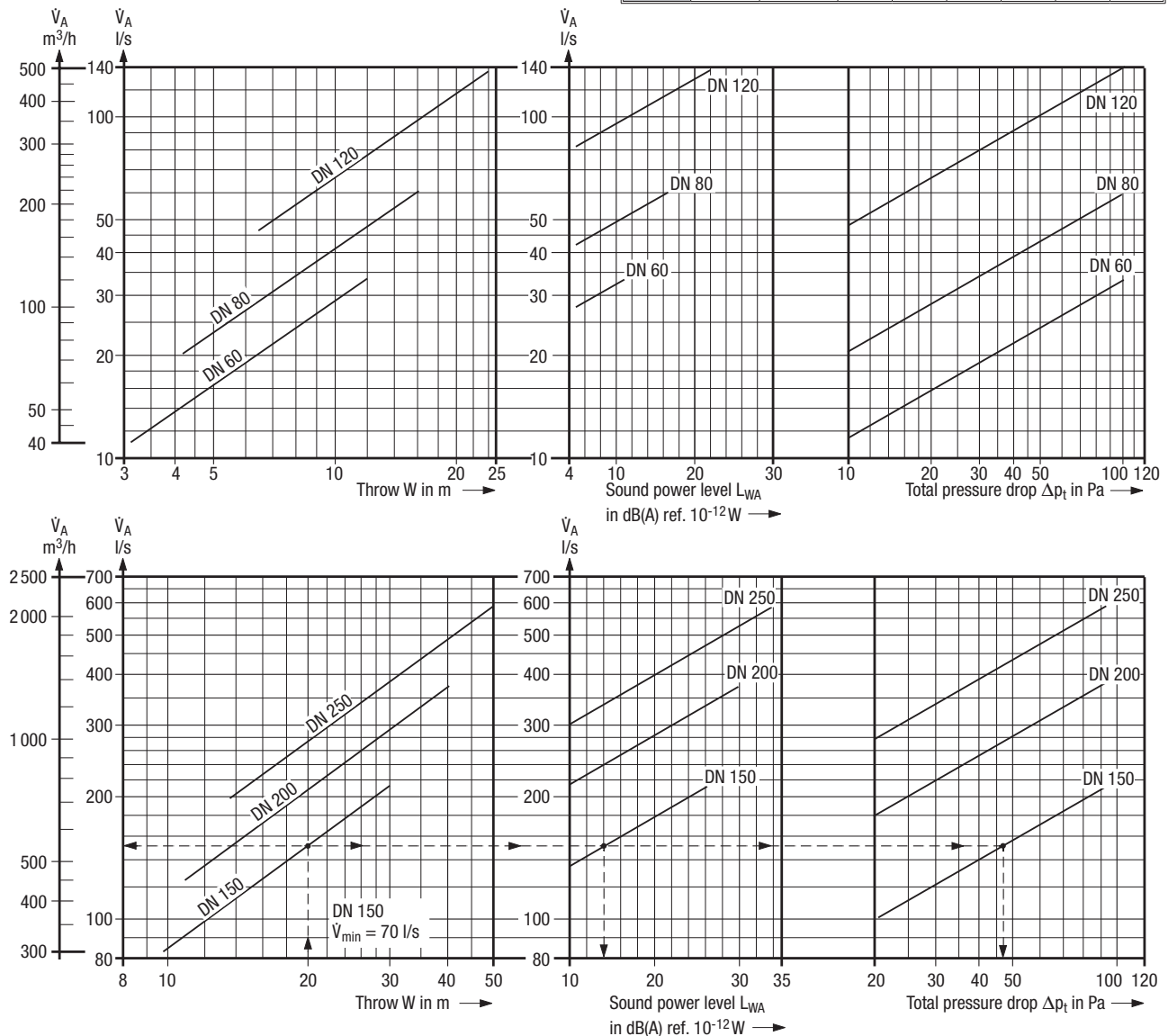## Layout sheet for DW-N2
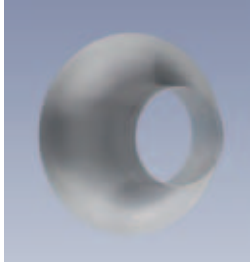
Note:

The diagram values for sound power level apply to connection type K (pressurized plenum). With connection to a straight circular duct (type R or F), the sound power level is 1 dB(A) higher, and even 3 dB(A) higher when connected to an elbow.

The pressure drop values apply to connection types K, R and F as well as behind an elbow.
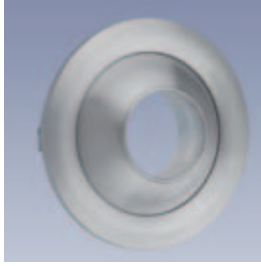
Sound power level of DW-N2

| Nozzle volume flow rate		Discharge velocity	Sound power level L_W in dB ref. 10^{-12} W					
			L_{WA}	Octave band centre frequency in Hz				
l/s	m³/h	m/s	dB(A)	125	250	500	1 K	2 K
DN 60								
22	80	8	—	—	—	—	—	—
28	100	10	6	12	—	—	—	—
33	120	12	12	18	12	—	—	—
DN 80								
40	145	8	3	11	—	—	—	—
50	180	10	10	18	—	—	—	—
61	220	12	17	25	14	14	10	—
DN 120								
89	320	8	8	14	—	—	—	—
114	410	10	16	22	14	13	11	—
136	490	12	22	28	20	19	17	—
DN 150								
142	510	8	12	20	—	—	—	—
178	640	10	19	27	16	15	15	—
211	760	12	26	34	23	22	22	15
DN 200								
250	900	8	16	27	17	12	10	—
315	1 130	10	24	35	25	20	18	—
380	1 360	12	30	41	31	26	24	15
DN 250								
395	1 420	8	20	27	19	18	15	—
490	1 770	10	27	34	26	25	22	13
590	2 120	12	34	41	33	32	29	19

Swivel jet nozzle
Layout sheet for DW-V2

Note:

The diagram values for sound power level apply to connection type K (pressurized plenum) at a nozzle angle of inclination $\alpha = 0°$.

The larger the angle of inclination α, the higher the sound power level, e.g.: $\alpha = 20°$ +1 dB(A)

$\alpha = 30°$ +2 dB(A)

With connection type R or F to a straight circular duct with L ≥ 3 DN, the sound power level is 1 dB(A) higher, and even 3 dB(A) higher when connected to an elbow.

The pressure drop values apply to connection types K, R and F, and a nozzle angle of inclination $\alpha = 0$ to 30°. With an elbow these values are to be raised by 5%.
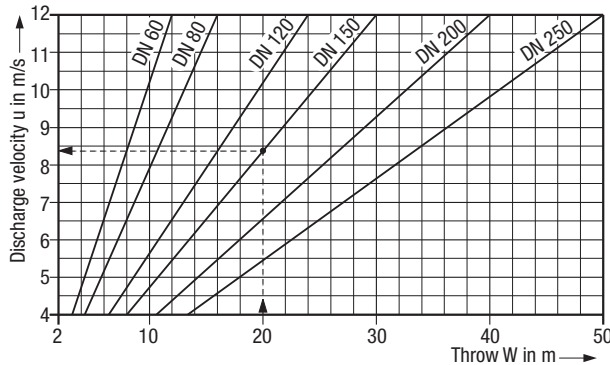

Layout example for connection to a pressurized plenum, without actuator:

1 Supply air volume flow rate $\dot{V}$ = 14 000 l/s

2 Requisite throw   W = 20 m

3 Angle of inclination α = 20°

4 Max. allowable sound power level L_{WA} = 25 dB(A) ref.10^{-12} W

From diagram:

5 Size   = DN 150   selected

6 Volume flow rate $\dot{V}_A$ = 150 l/s

7 Sound power level L_{WA} = 20 dB(A) ref.10^{-12} W at 0°

  L_{WA} = 21 dB(A) ref.10^{-12} W at 20°

8 Total pressure drop $\Delta p_t \approx$ 60 Pa

9 Number   Z = 93 units   [from **1** : **6**]

10 Discharge velocity   u = 8.5 m/s
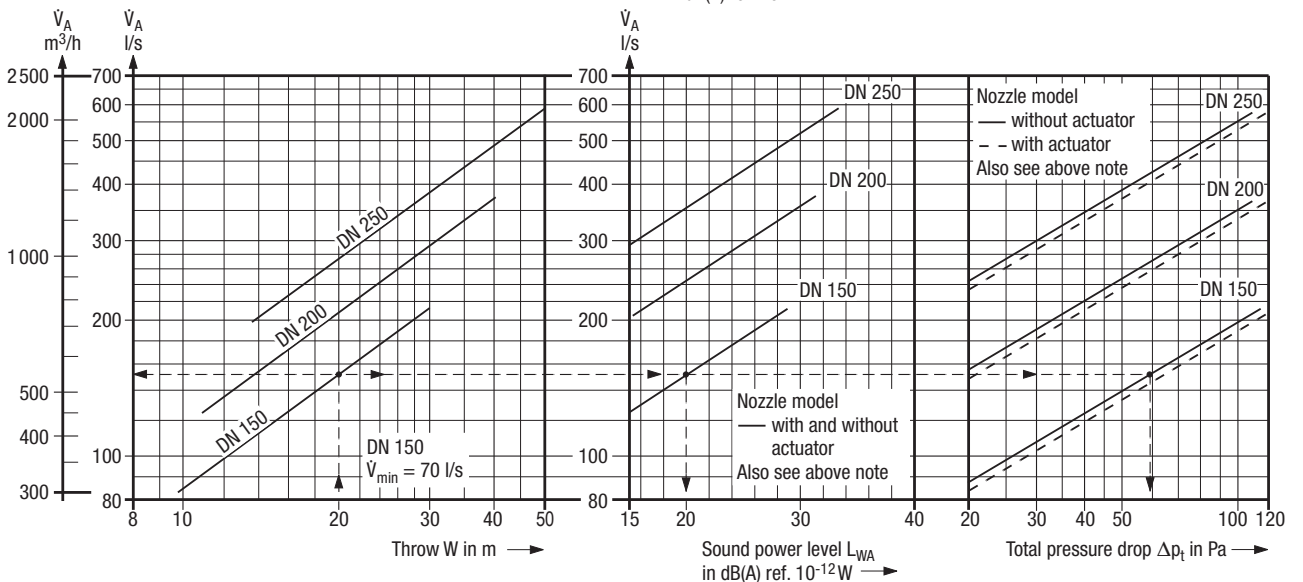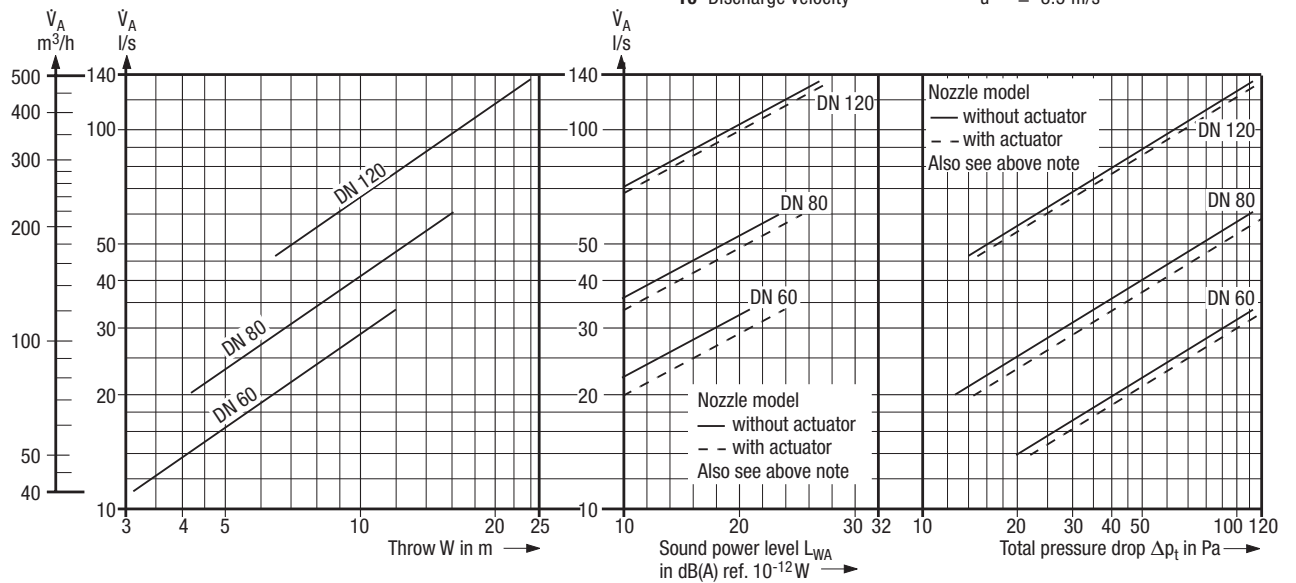
Swivel jet nozzle
Sound power level of DW-V2

Angle of inclination	Nozzle volume flow rate		Discharge velocity	Sound power level L_W in dB ref. 10^{-12} W							Sound power level L_W in dB ref. 10^{-12} W						
				L_{WA}	Octave band centre frequency in Hz						L_{WA}	Octave band centre frequency in Hz					
α	l/s	m³/h	m/s	dB(A)	125	250	500	1 K	2 K	4 K	dB(A)	125	250	500	1 K	2 K	4 K
DN 60				**Without actuator**							**With actuator** [1]						
0°	22	80	8	10	12	—	—	—	—	—	13	17	13	11	—	—	—
	28	100	10	16	20	16	14	11	—	—	19	23	19	17	14	—	—
	33	120	12	21	24	21	19	16	10	—	24	28	24	22	19	12	12
20°	22	80	8	11	15	11	—	—	—	—	14	18	14	12	—	—	—
	28	100	10	17	21	17	15	12	—	—	20	24	20	18	15	—	—
	33	120	12	22	26	22	20	17	10	10	25	29	25	23	20	13	13
30°	22	80	8	12	16	12	10	—	—	—	15	19	15	13	10	—	—
	28	100	10	18	22	18	16	13	—	—	21	25	21	19	16	—	—
	33	120	12	23	27	23	21	18	11	11	26	30	26	24	21	14	14
DN 80				**Without actuator**							**With actuator** [1]						
0°	40	145	8	13	13	13	10	—	—	—	15	19	17	15	—	—	—
	50	180	10	19	23	21	18	10	—	—	21	25	23	21	13	—	—
	61	220	12	23	28	25	23	17	10	—	25	29	27	25	17	10	10
20°	40	145	8	14	18	16	14	—	—	—	16	20	18	16	—	—	—
	50	180	10	20	24	22	20	12	—	—	22	26	24	22	14	—	—
	61	220	12	24	28	26	24	16	—	—	26	30	28	26	18	11	11
30°	40	145	8	15	19	17	15	—	—	—	17	21	19	17	—	—	—
	50	180	10	21	25	23	21	13	—	—	23	27	25	23	15	—	—
	61	220	12	25	29	27	25	17	10	10	27	31	29	27	19	12	12
DN 120				**Without actuator**							**With actuator** [1]						
0°	89	320	8	16	27	19	10	—	—	—	17	27	20	12	—	—	—
	114	410	10	22	33	25	17	13	—	—	23	33	26	18	14	—	—
	136	490	12	27	36	30	23	19	14	10	28	38	31	23	19	13	12
20°	89	320	8	17	27	20	12	—	—	—	18	28	21	13	—	—	—
	114	410	10	23	33	26	18	14	—	—	24	34	27	19	15	—	—
	136	490	12	28	38	31	23	19	13	12	29	39	32	24	20	14	13
30°	89	320	8	18	28	21	13	—	—	—	19	29	22	14	10	—	—
	114	410	10	24	34	27	19	15	—	—	25	35	28	20	16	10	—
	136	490	12	29	39	32	24	20	14	13	30	40	33	25	21	15	14
DN 150				**Without and with actuator** [1]													
0°	142	510	8	18	30	19	14	—	—	—							
	178	640	10	24	34	26	22	15	—	—							
	211	760	12	29	38	31	27	22	14	10							
20°	142	510	8	19	29	21	16	10	—	—							
	178	640	10	25	35	27	22	16	—	—							
	211	760	12	30	40	32	27	21	14	14							
30°	142	510	8	20	30	22	17	11	—	—							
	178	640	10	26	36	28	23	17	10	10							
	211	760	12	31	41	33	28	22	15	15							
DN 200				**Without and with actuator** [1]													
0°	250	900	8	21	29	18	21	—	—	—							
	315	1 130	10	27	35	24	27	17	—	—							
	380	1 360	12	31	30	30	32	24	14	10							
20°	250	900	8	22	30	19	22	13	—	—							
	315	1 130	10	28	36	25	28	19	—	—							
	380	1 360	12	32	40	29	32	23	12	11							
30°	250	900	8	23	31	20	23	14	—	—							
	315	1 130	10	29	37	26	29	20	—	—							
	380	1 360	12	32	40	29	32	23	12	11							
DN 250				**Without and with actuator** [1]													
0°	395	1 420	8	23	32	20	23	11	—	—							
	490	1 770	10	29	37	27	29	19	—	—							
	590	2 120	12	33	40	32	34	26	16	12							
20°	395	1 420	8	24	32	22	24	15	—	—							
	490	1 770	10	30	38	28	30	21	10	10							
	590	2 120	12	34	42	32	34	25	14	14							
30°	395	1 420	8	25	33	23	25	16	—	—							
	490	1 770	10	31	39	29	31	22	11	11							
	590	2 120	12	35	43	33	35	26	15	15							

Sound power level

Thanks to its excellent acoustic properties the swivel jet nozzle is most suitable for use in large spaces with high acoustic requirements such as concert halls, theatres, conference rooms, museums, etc.

The sound power levels listed here apply to connection type K (pressurized plenum). With connection type R or F to a straight circular duct with L ≥ 3 DN, the sound power level is 1 dB(A) higher, and even 3 dB(A) higher with an elbow.

Increase in sound power level ΔL in relation to air velocity u_L when mounted in a rectangular duct

u_L in m/s	2.0	2.5	3.0	4.0	5.0	6.0
ΔL in dB	0	0	0	4	8	12

[1] Actuator running noise < 35 dB(A)
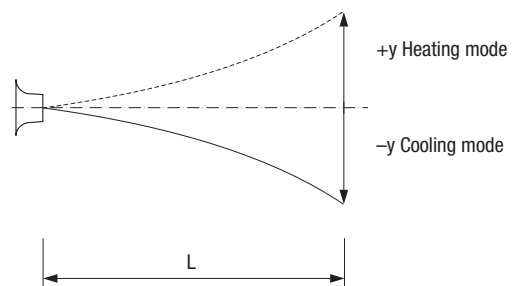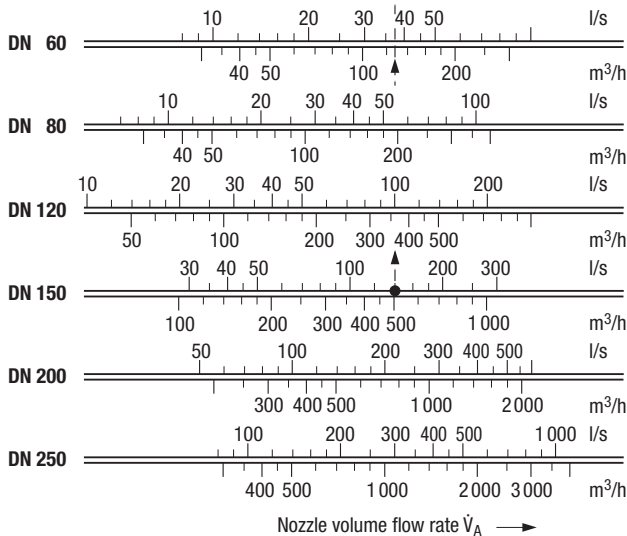
Jet nozzle
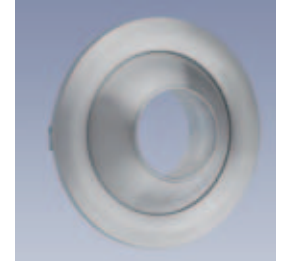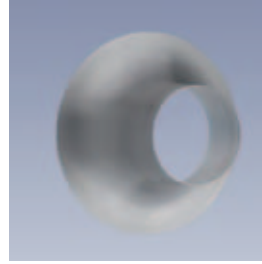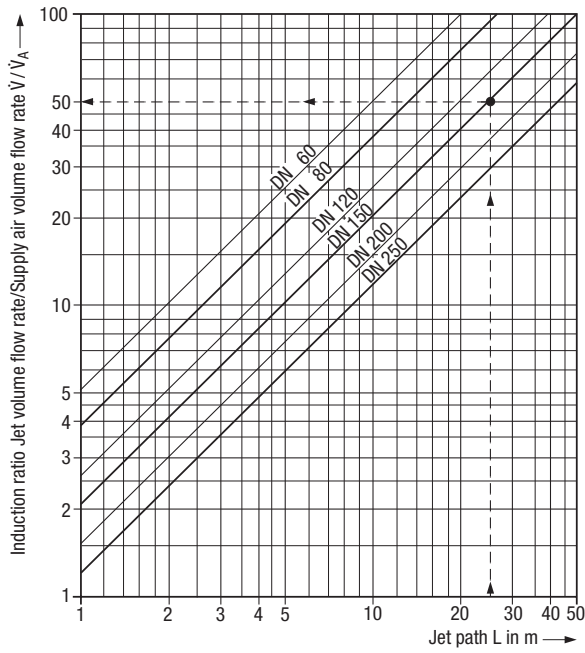
◀ Induction ratio

Example: Size **DN 150**

Jet path   L   =   25 m

From graph:

Induction ratio Jet/Supply air volume flow rate $\dot{V}/\dot{V}_A = 50$,

i.e. mixing of 49-fold indoor air volume flow rate after 25 m jet path

Example:

Nozzle volume flow rate	$\dot{V}_A$ = 140 l/s
Temperature difference supply air to indoor air	$\Delta\vartheta_{ZL-RL}$ = +6 K (Heating)

Size **DN 150**

From graph:

Jet path	L = 10 m
Jet deflection	y ≈ +1.1 m after 10 m jet path
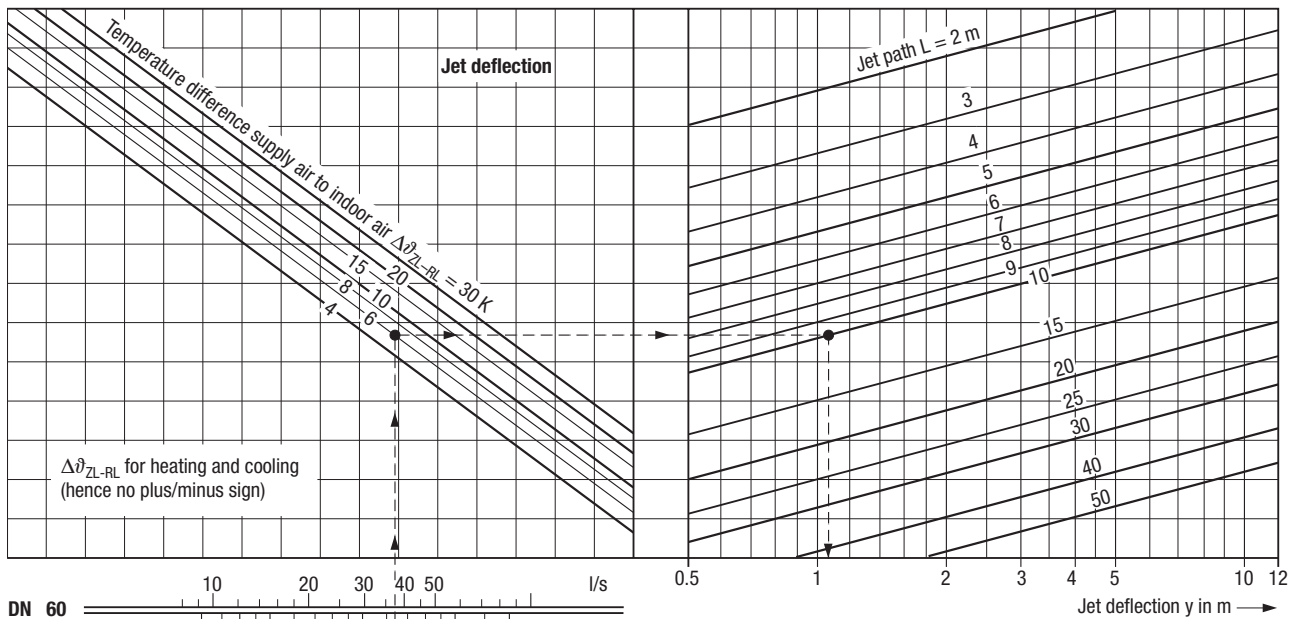
Jet nozzle
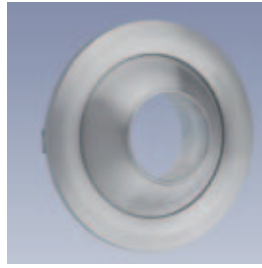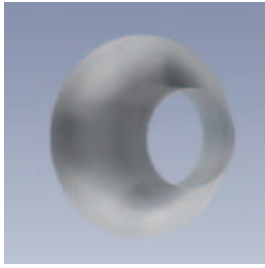
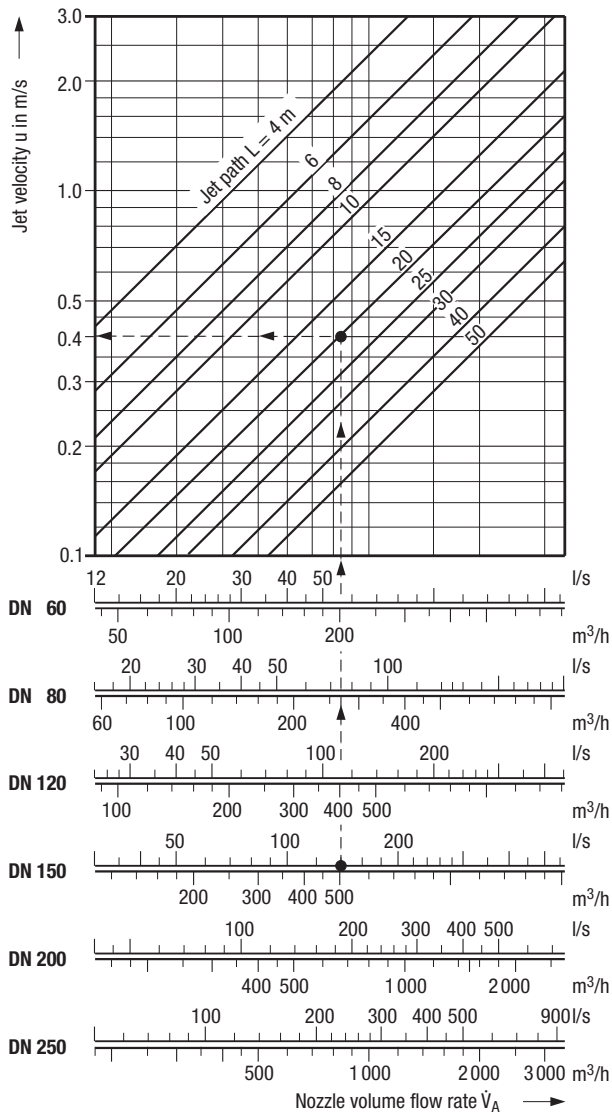## Decrease in jet velocity [1]

Example:

	Size **DN 150**
Nozzle volume flow rate	$\dot{V}_A$ = 140 l/s (u_0 = 7.85 m/s)
Jet path	L = 20 m

From graph:

Decrease in discharge velocity	u_0 =	7.85 m/s
to jet velocity	u =	0.4 m/s after 20 m jet path

Decrease in jet temperature
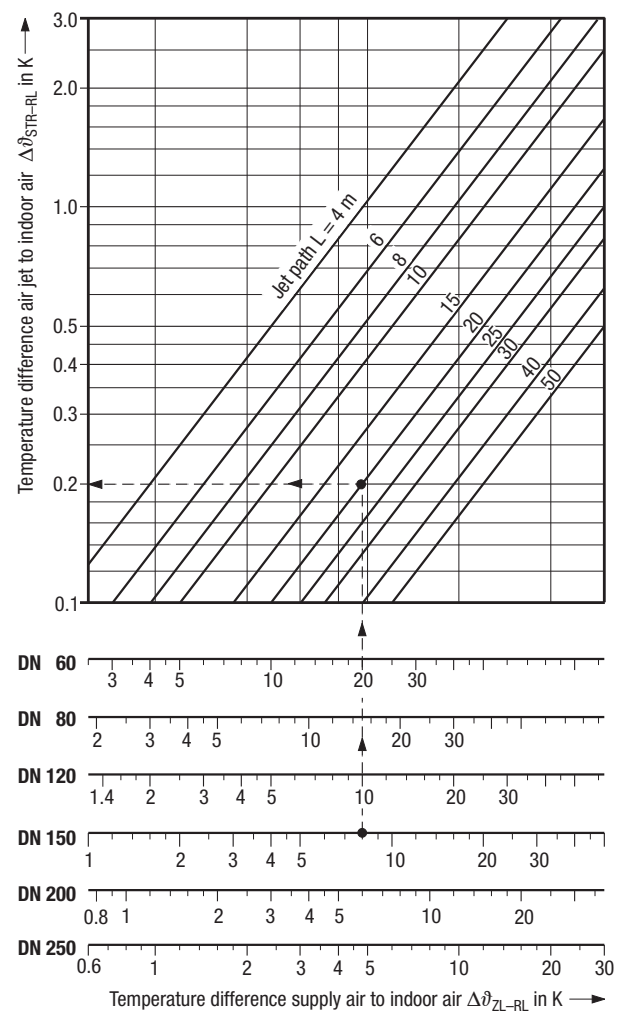
Example:

	Size **DN 150**
Temperature difference	
supply air to indoor air	$\Delta\vartheta_{ZL\text{-}RL}$ = 8 K
Jet path	L = 20 m

From graph:

Decrease in temperature difference $\Delta\vartheta_{ZL\text{-}RL}$ = 8 K to $\Delta\vartheta_{Str\text{-}RL}$ = 0.2 K after 20 m jet path

---

[1] Jet velocity in the jet axis at the respective points of observation on the jet paths

Twist nozzle

DW-V2-...-DR – Layout sheet and sound power level

The decrease in jet velocity can be determined using the graph on page 12. For this purpose, the jet path of the twist nozzle must be multiplied by 0.5. Ex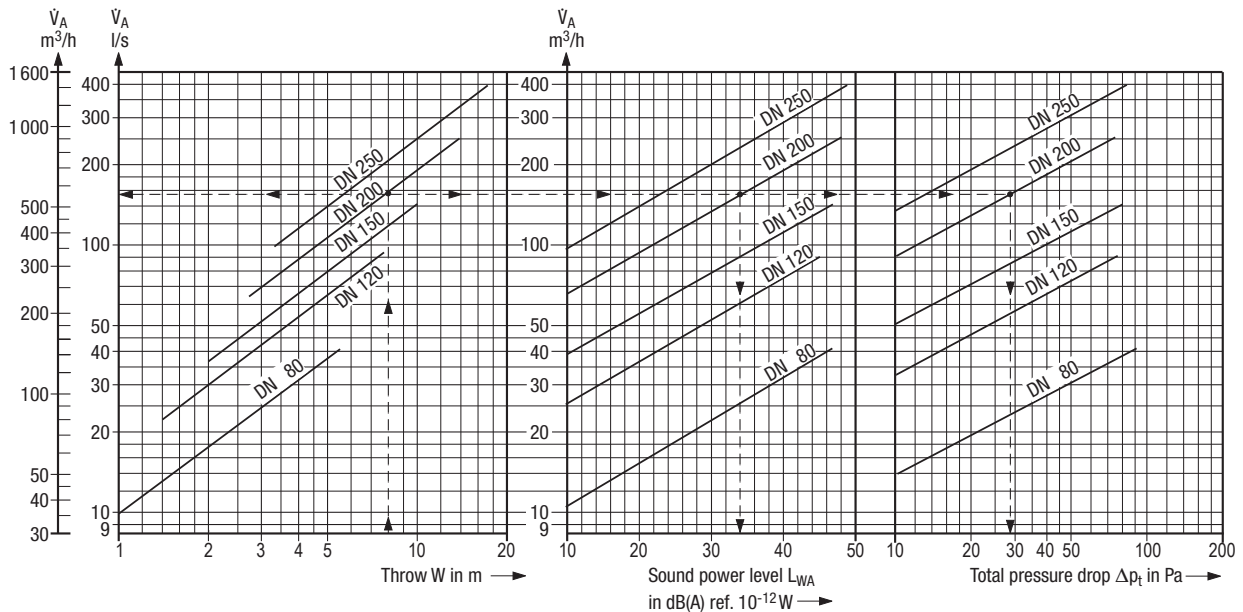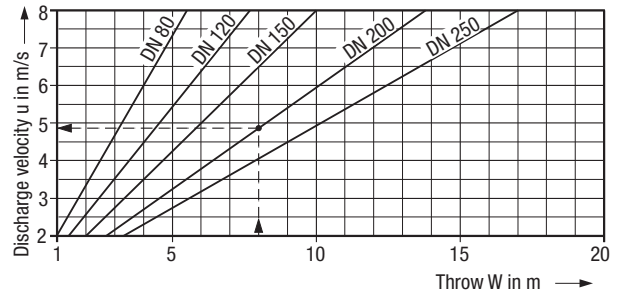ample: jet velocity u = 0.4 m/s with DN 150 and $\dot{V}$ = 139 l/s [500 m³/h] results in jet path L = 20 m (for DW-V2) which, multiplied by factor 0.5, results in a jet path of 10 m with the twist nozzle.

Layout example:

1 Supply air volume flow rate $\dot{V}$ = 6 111 l/s
2 Maximum throw   W   = 8 m
3 Max. allowable sound power level L_{WA} = 35 dB(A) ref.10^{-12} W

From graph:

4 Size   = DN 200   selected
5 Volume flow rate $\dot{V}_A$ = 156 l/s
6 Sound power level L_{WA} ≈ 34 dB(A) ref.10^{-12} W
7 Total pressure drop Δp_t ≈ 29 Pa
8 Number   Z   = 40 units [from **1 : 5**]
9 Discharge velocity   u   = 4.9 m/s

Sound power level of DW-V2-...-DR

Size	Nozzle volume flow rate		Discharge velocity	Total pressure drop	Sound power level L_W in dB ref. 10^{-12} W						
					L_{WA}	Octave band centre frequency in Hz					
	l/s	m³/h	m/s	Pa	dB(A) ref.10^{-12} W	125	250	500	1 K	2 K	4 K
DN 80	10	35	2	5	8	18	10	—	—	—	—
	19	70	4	20	27	35	30	23	24	11	—
	31	110	6	50	38	43	41	34	34	29	18
	40	145	8	88	46	49	47	42	41	39	29
DN 120	22	80	2	5	7	19	—	—	—	—	—
	44	160	4	18	26	33	27	21	22	12	—
	64	240	6	41	37	42	37	31	34	28	14
	92	330	8	76	45	48	44	38	38	41	27
DN 150	36	130	2	5	8	17	10	—	—	—	—
	69	250	4	19	27	33	26	26	23	11	—
	106	380	6	41	38	42	38	33	35	28	16
	142	510	8	77	47	49	46	41	41	41	29
DN 200	61	220	2	5	9	17	12	—	—	—	—
	125	450	4	19	28	33	28	28	23	12	—
	186	670	6	43	39	44	38	36	35	30	18
	253	910	8	78	48	51	47	44	42	42	30
DN 250	97	350	2	5	11	18	13	—	—	—	—
	197	710	4	21	30	34	30	29	25	14	—
	294	1 060	6	46	40	43	39	36	37	31	22
	395	1 420	8	83	48	51	48	44	43	42	33

Increase in sound power level ΔL in relation to air velocity u_L when mounted in a rectangular duct

u_L in m/s	2.0	2.5	3.0
ΔL in dB	0	0	0

u_L in m/s	4.0	5.0	6.0
ΔL in dB	3	5	7

Jet nozzle and twist nozzle

Features and type code

Features at a glance

General features

- Installation in the wall of a pressurized plenum or rectangular duct
- Insertion into circular ducts to EN 1506, with seal
- Connection to shaped parts to EN 1506, with slip-on end
- Swivel jet nozzle with concealed fastening screws
- Flexible duct connection for manual adjustment also available
- Adjustment options: manually, by electric actuator or, without auxiliary energy, by maintenance-free thermostatic control unit
- The thermostatic control unit allows for resetting; the swivel range can be altered in increments of 5°, up to 20° in total. The mechanism of the thermostatic control unit is protected from undue application of force by a device that can disengage and engage again when the nozzle is swivelled by hand.
- Material:
  - Nozzle: aluminium
  - Slip-on and push-in ends: galvanized sheet metal
  - Twist element: black-painted sheet metal
- Colour: aluminium in natural colour or painted to a RAL colour
- Unobtrusive placement possible, e.g. behind the wall finish
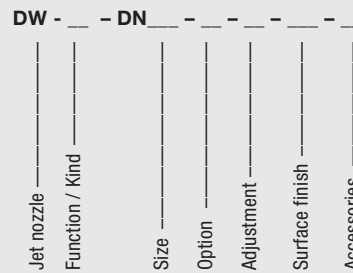
Jet nozzles

- Throws up to 50 m
- Available in 6 sizes for volume flow rates up to 590 l/s [2 120 m³/h]
- Very low sound power level
- Low pressure drop,
  swivel nozzle: $\zeta = 1.35$
  non-adjustable nozzle: $\zeta = 1.05$
  related to discharge velocity

Twist nozzles

- Throws up to 17 m
- Available in 5 sizes for volume flow rates up to 395 l/s [1 420 m³/h]

Type code

DW - __ – DN___ – __ – __ – __ – ___ – __

| Jet nozzle | Function / Kind | Size | Option | Adjustment | Surface finish | Accessories |

Function / Kind

N2 = non-adjustable
V2 = swivel type

Size

60 = DN 60		150 = DN 150	
80 = DN 80		200 = DN 200	
120 = DN 120		250 = DN 250	

Option

K = connection to pressurized plenum (duct wall)
F = for slipping onto shaped part
R = for pushing into circular duct
B = connector for connection to flexible duct (DW-V2 only) [1]

Adjustment (DW-V2 only)

	DN 60	DN 80	DN 120	DN 150	DN 200	DN 250
MA = manual	•	•	•	•	•	•
E22 = „Siemens actuator, 0 – 10 V modulation", stroke drive type GDB161.2E	•	•	•	•	•	
E23 = „Siemens actuator, 3-point type, 24 V", stroke drive type GDB131.2E	•	•	•	•	•	
E24 = „Siemens actuator, 3-point type, 230 V", stroke drive type GDB331.2E	•	•	•	•	•	
E25 = „Siemens actuator, 0 – 10 V modulation", stroke drive type GLB161.2E						•
E26 = „Siemens actuator, 3-point type, 24 V", stroke drive type GLB131.2E						•
E27 = „Siemens actuator, 3-point type, 230 V", stroke drive type GLB331.2E						•
T1 = Thermostatic control unit, 20 – 28°C			•	•	•	•

Surface finish

0 = no coating
…. = face painted to RAL ….

Accessories (DW-V2 only)

0 = none
DR = with twist element (from DN 80 upwards)

[1] Only suitable for manual adjustment
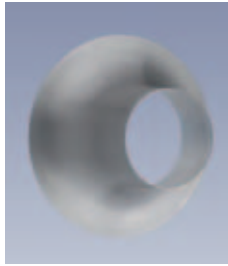
Jet nozzle and twist nozzle
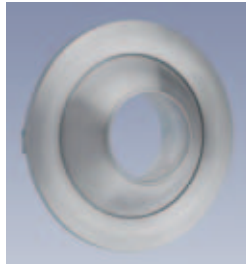
Tender text

Fig. 13: DW-N2

Fig. 14: DW-V2

Fig. 15: DW-V2-...-DR

Fig. 16: DW-V2 with electric actuator

Fig. 17: DW-V2 with thermostatic control unit

Tender text
– Jet nozzle DW-N2 [1]

.... units

Non-adjustable jet nozzle for air distribution into large spaces, with rounded intake featuring good aerodynamic and acoustic properties.

– **Connection type K** with flange for connection to a pressurized plenum or a rectangular duct.
– **Connection type R** with push-in end for insertion into a circular duct to EN 1506, with seal.
– **Connection type F** with slip-on end for shaped parts to EN 1506.

Material:
– Nozzle body made of aluminium in natural colour or painted to RAL ....
– Push-in and slip-on ends made of galvanized sheet metal

Make: KRANTZ KOMPONENTEN

Type: DW - N2 – DN___ – __ – ___

– Swivel jet nozzle DW-V2, Twist nozzle DW-V2-...-DR

.... units

Swivel jet nozzle with rounded intake featuring good aerodynamic and acoustic properties, housed in a hemispheric casing with opposite swivel bearings, swivel range ± 30°, designed as

– **jet nozzle** with large jet penetration depth for air distribution into large spaces, discharge direction adjustable in the horizontal and vertical planes, or
– **twist nozzle** [2] with small jet penetration depth for air distribution into narrow spaces, with built-on twist element,

fitted with:

fastening flange to accommodate the hemisphere and the nozzle, turnable within slot segments for setting the discharge direction as required; a scale with 10-degree division helps set the discharge direction accurately when tuning the HVAC system. The discharge direction can be adjusted manually, by electric actuator or, without auxiliary energy, by a self-acting thermostatic control unit. With thermostatic control unit, the factory-set swivel range can be altered manually once the swivel jet nozzle is installed; this is possible in increments of 5° and up to 20° in total. The mechanism of the thermostatic control unit is protected from undue application of force by a device that can disengage and engage again when the nozzle is swivelled by hand.

– **Connection type K** with flange for connection to a pressurized plenum or a rectangular duct, inclusive of collar to conceal the fastening screws.
– **Connection type R** with push-in end for insertion into a circular duct to EN 1506, with seal.
– **Connection type F** with slip-on end for shaped parts to EN 1506.
– **Connection type B** with connector for flexible duct.

Material:
– Nozzle body and collar made of aluminium in natural colour or painted to RAL ....
– Push-in and slip-on ends made of galvanized sheet metal
– Twist element [2] made of galvanized sheet metal, black-painted

Make: KRANTZ KOMPONENTEN

Type: DW - V2 – DN___ – __ – __ – ___ – __

Subject to technical alterations.

[1] Available with twist element on request

[2] Available for size DN 80 up to DN 250