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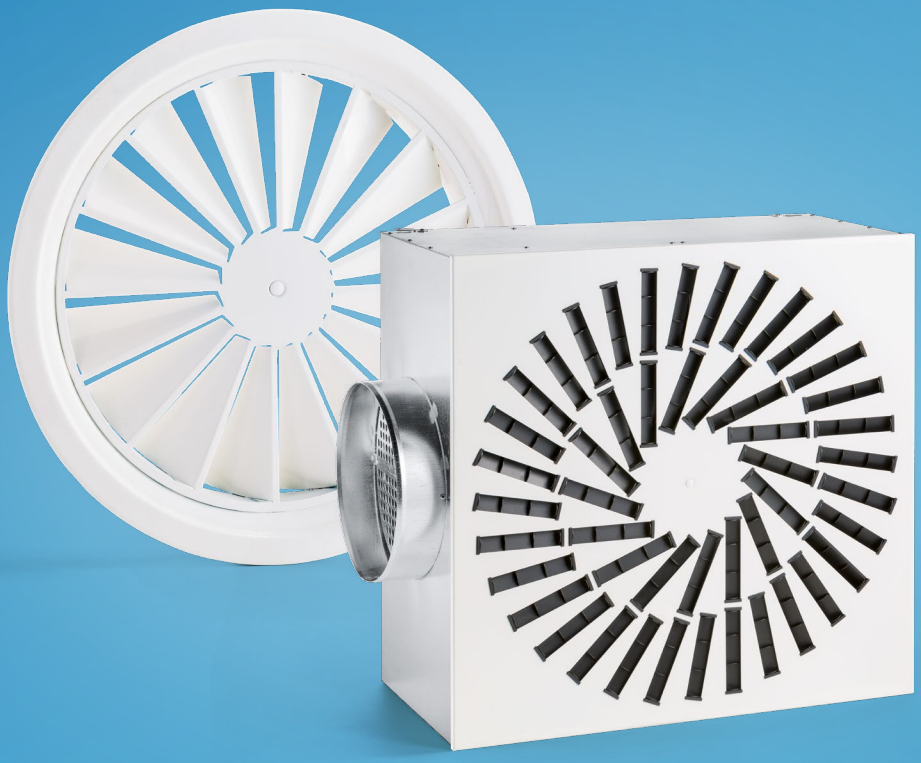
Swirl diffusers



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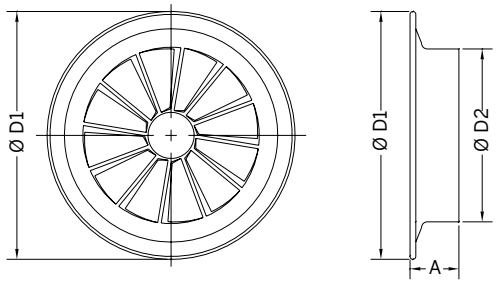
Swirl diffusers
DRA 1

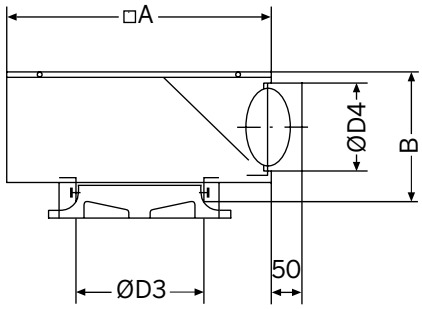
Swirl diffuser
DRA1, round

PRODUCT DESCRIPTION

The round swirl diffuser DRA 1 with 10-17 fixed blades is used in rooms with heights of 2.4-4 m. The flat blade angle produces a ceiling jet (Coandă effect). Thanks to the high induction, the temperature and velocity of the air in the room is rapidly reduced. The diffusers, which are suitable for both supply and extract air, are designed for an supply air temperature difference of up to ±12 K. Uniform air distribution can be ensured by means of a plenum box with an integrated air distribution element, which we can provide. The air outlet is fixed with a central screw and is coated in RAL 9010 as standard.

We reserve the right to make technical modifications.





Delivery sizes					
NW	Ø D1	Ø D2	A	Blade Amount	Weight kg
160	249	157	50	10	0.35
200	289	197	50	12	0.46
250	339	247	52	14	0.65
315	405	312	54	16	0.95
355	445	352	54	17	1.20

Dimensions of plenum box for DRA1				
Size	A [mm]	W [mm]	Ø D3 [mm]	Ø D4 [mm]
160	348	200	160	98
200	398	225	200	123
250	498	260	250	158
315	598	300	315	198
355	598	350	355	248

ACCESSORIES

Plenum box AK, optionally with

throttle damper dk

Perforated plate LB

Transition connector to a spiral slip tubing "ÜGS" of the next smallest nominal size

SPECIAL VERSIONS

RAL colour of your choice

DRA 1

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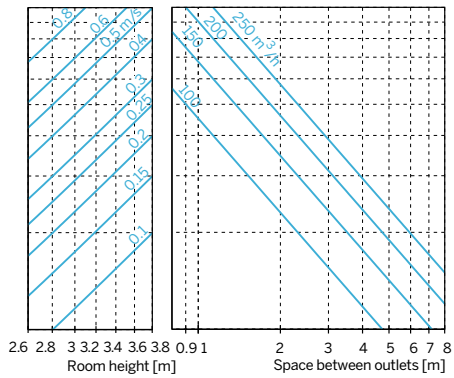
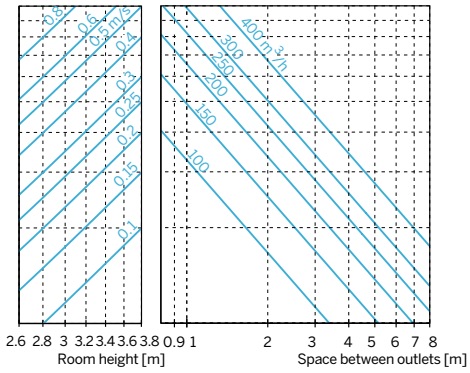
TECHNICAL PARAMETERS

Room air velocity outlet distance

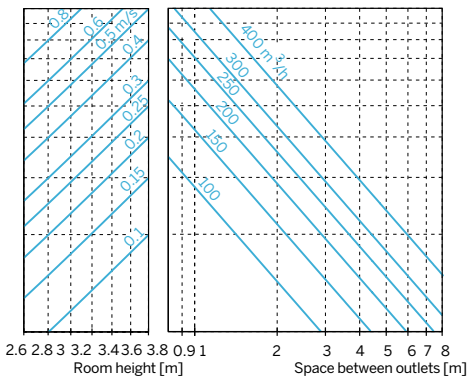
NW 160



NW 200

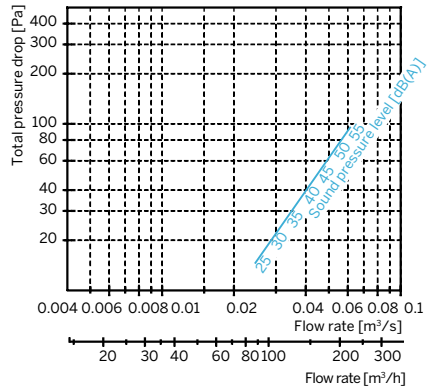


NW 250

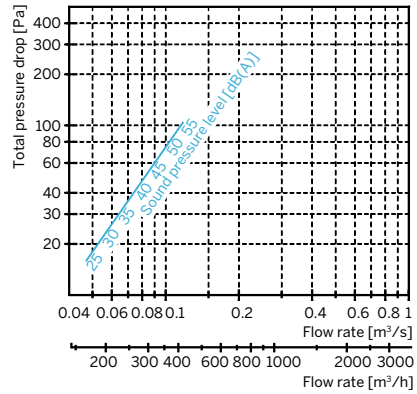


Sound power, pressure drop

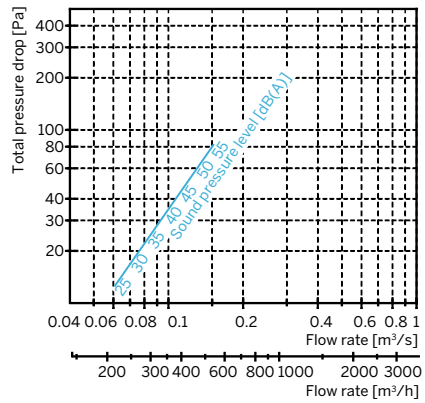
NW 160



NW 200



NW 250



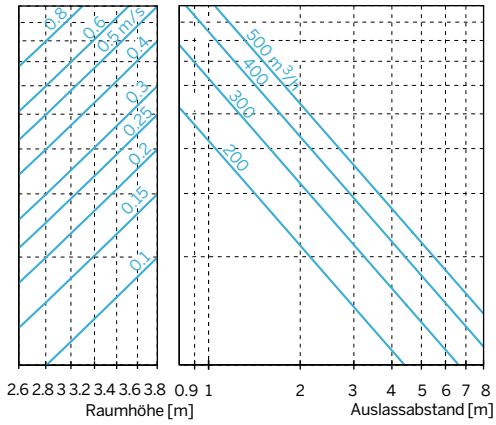
Swirl diffuser
DRA1, round

TECHNICAL PARAMETERS

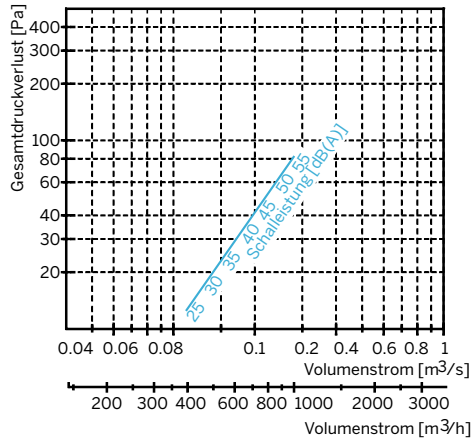
Room air velocity outlet distance

Sound power, pressure drop

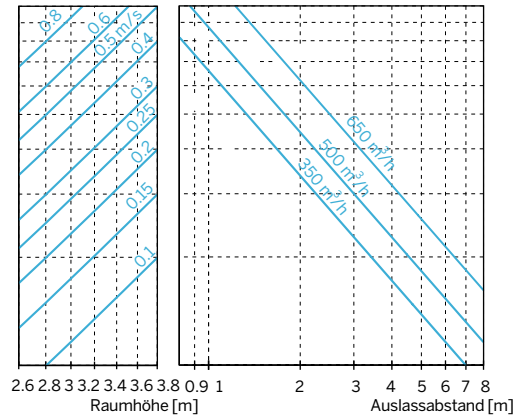
NW 315



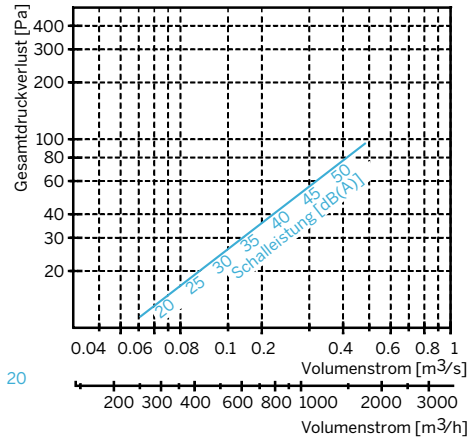
NW 315



NW 355



NW 355



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TYPE CODES

DRA 1 – NW – AK – RAL 9010

Surface
Powder coating, RAL colour of choice
(standard colour RAL 9010)

Accessories

AK	–	plenum box
AKdk	–	plenum box with throttle damper and perforated plate (supply air)
ÜGS	–	transition connector to next smallest nominal diameter of tubing incl. duct mounting subframe

Delivery size

NW	–	nominal diameter 160, 200, 250, 315, 355

Types of air diffuser

DRA 1	–	circular swirl diffuser, fixed blades

EXAMPLE ORDER

Swirl diffuser, round

NW 250

Plenum box, galvanised steel

Standard colour RAL 9010
(special RAL colour possible at an extra charge)

Order code

DRA1-NW250-AK-RAL9010

Swirl diffusers
DRA 2

Swirl diffuser DRA 2, round and square

PRODUCT DESCRIPTION

The DRA 2 is a high induction swirl diffuser with radially arranged blades designed for room and ceiling heights up to 4 m. The blades are arranged so as to produce a ceiling jet (Coandă effect). This setting enables air to be introduced into the room at a temperature difference of up to 12 Kelvin, without creating a draught, by means of a rapid reduction in air velocity.

The swirl diffuser is supplied with a central counter punched hole and matching screw and cap. The plenum box has been acoustically and aerodynamically matched to the swirl diffuser DRA 2 in laboratory tests and is also available with a throttle damper and insulation on request.

The square version of the DRA 2 is intended for installation in a suspended ceiling grid and is supplied with a reinforcing ring in the back. The standard design is coated in RAL colour 9010; other colours are also available as special designs.

We reserve the right to make technical modifications.

SPECIAL VERSIONS

RAL colour of your choice

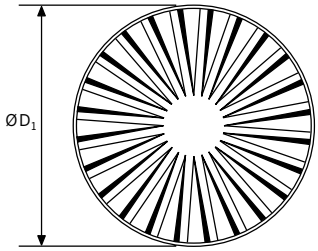
RECOMMENDED RANGE

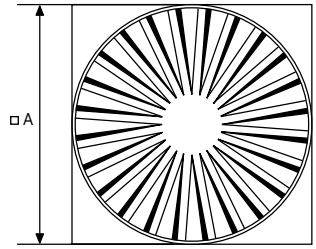
Sizes	$\dot{V}_{min}$		$\dot{V}_{max}$	
	l/s	m³/h	l/s	m³/h
325	35	120	70	250
400	45	160	170	600
500	70	250	200	720
600	85	300	250	900
625	85	300	250	900

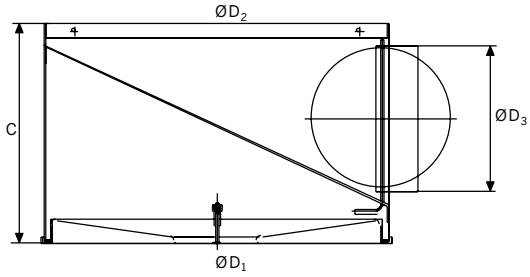
DRA 2

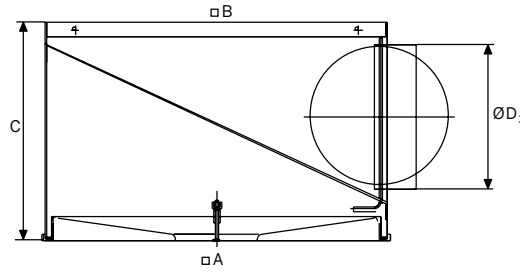
Swirl diffuser DRA 2, round and square

DIMENSIONS









DIMENSIONS, ROUND

Sizes	Ø D_1	Ø D_2	Ø D_3	C
325	323	310	158	210
400	398	375	198	250
500	498	455	198	250
600	598	558	248	300
625	623	558	248	300

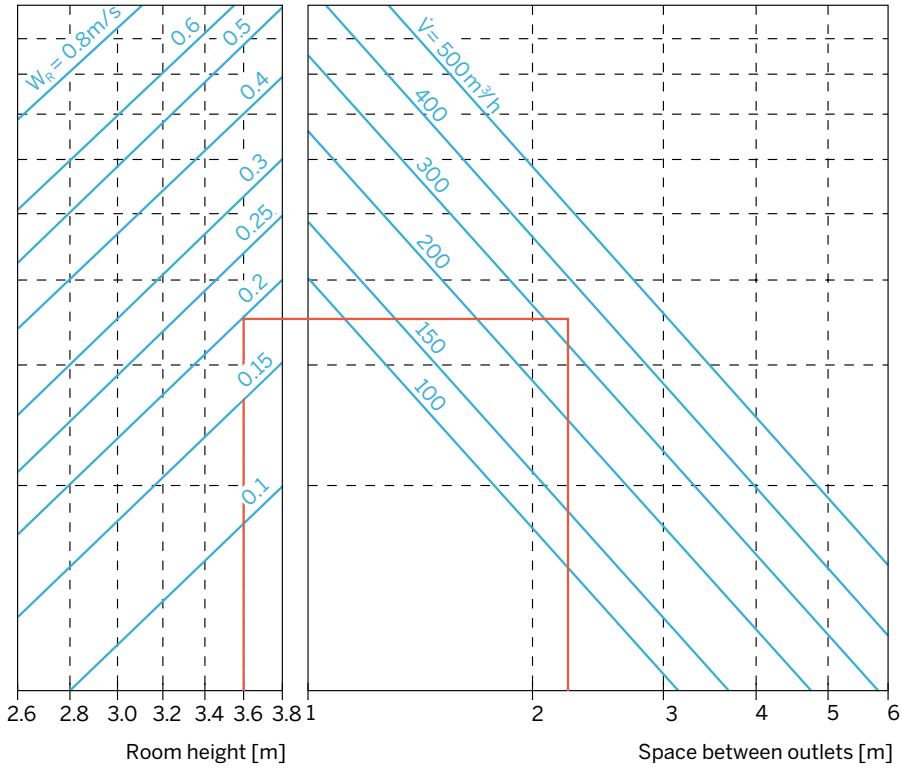
DIMENSIONS, SQUARE

Sizes	A	W	C	Ø D_3
325	323	310	210	158
400	398	375	250	198
500	498	455	250	198
600	595	558	300	248
625	623	558	300	248

SOUND LEVEL REDUCTION ΔL_W DUE TO INSULATED PLENUM BOX

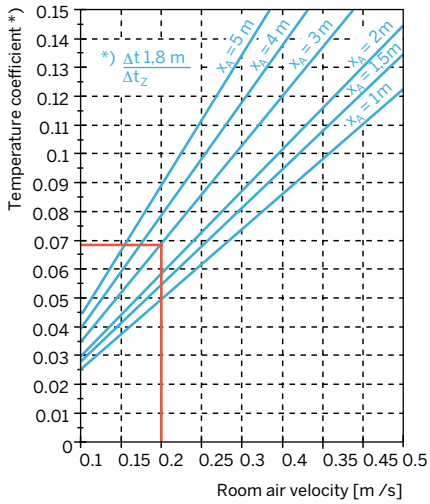
ΔL_W (dB)							
83	125	250	500	1000	2000	4000	8000
1	3	3	11	15	15	15	15

ROOM AIR VELOCITY, OUTLET DISTANCE [DIAGRAM 1]

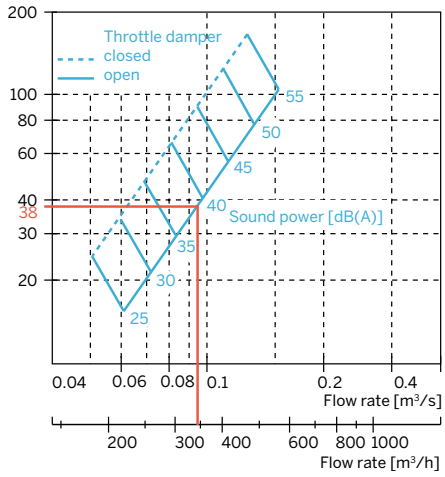


DRA 2 ☐ 400, Ø 400, measurement under isothermal conditions with multi-row square outlet arrangement

TEMPERATURE COEFFICIENT [DIAGRAM 2]

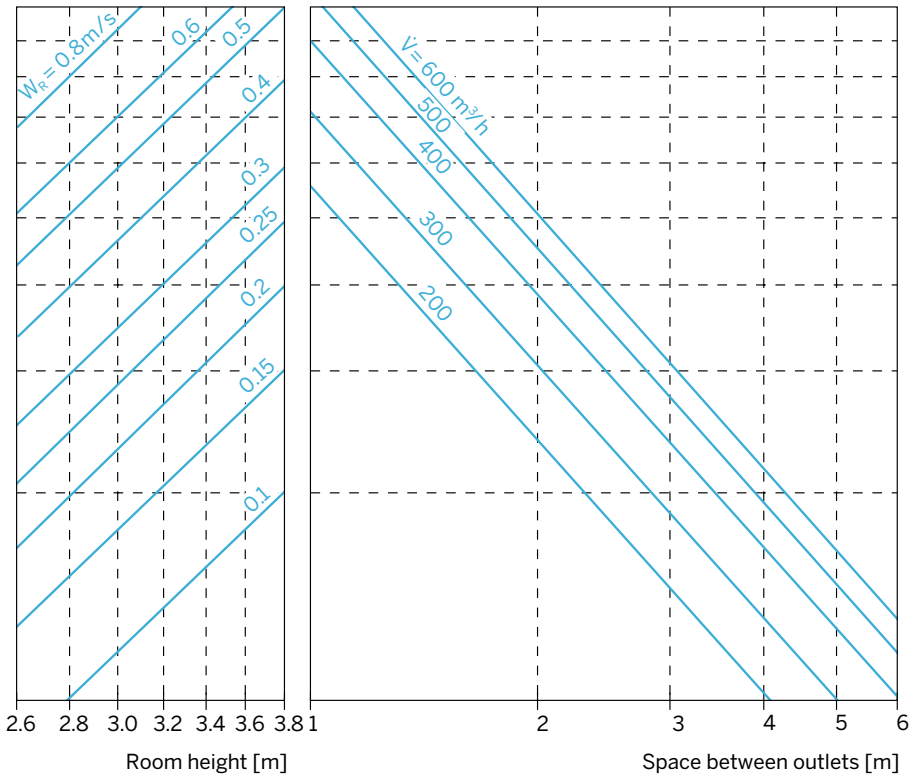


SOUND POWER LEVEL, PRESSURE DROP [DIAGRAM 3]



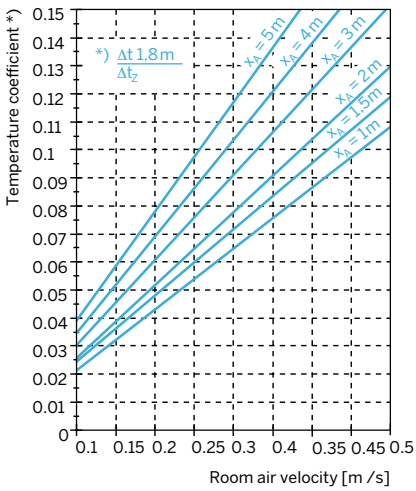
Swirl diffuser DRA 2, round and square

ROOM AIR VELOCITY, OUTLET DISTANCE

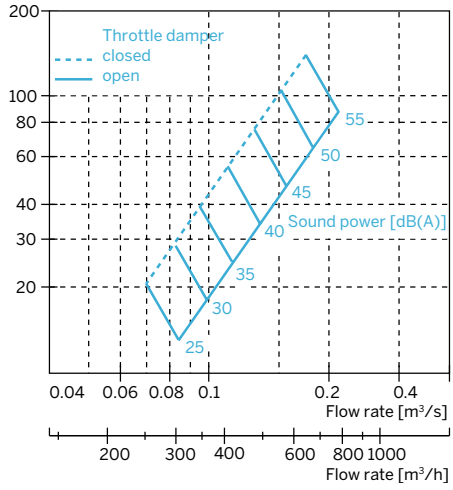


DRA 2 □500, Ø 500, measurement under isothermal conditions with multi-row square outlet arrangement

TEMPERATURE COEFFICIENT



SOUND POWER, PRESSURE DROP



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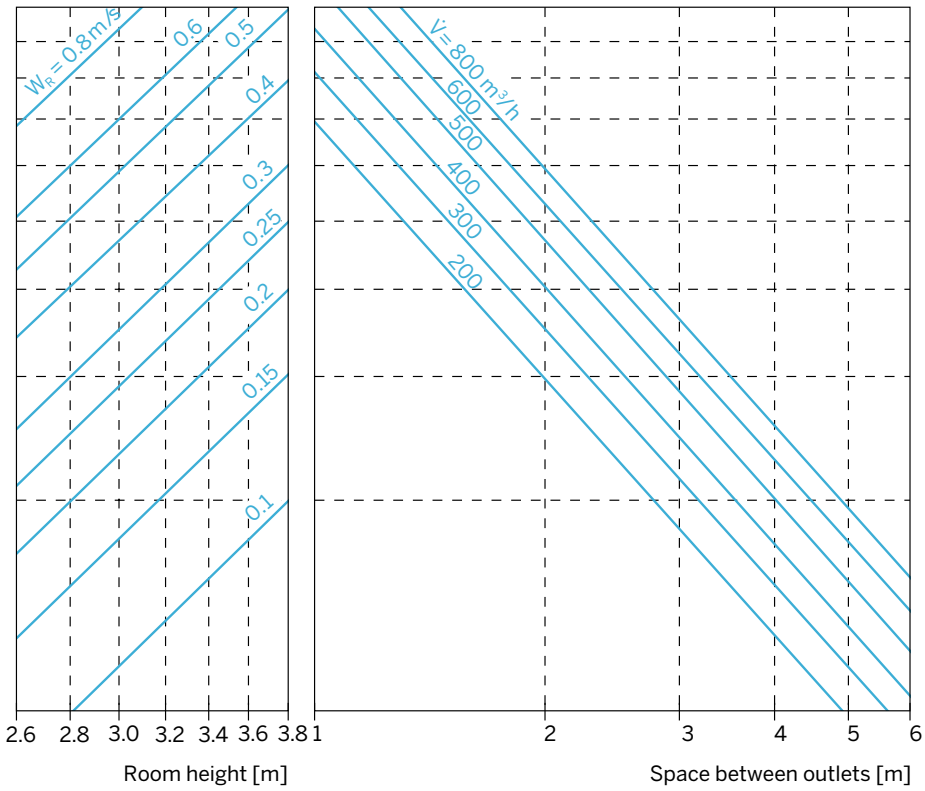
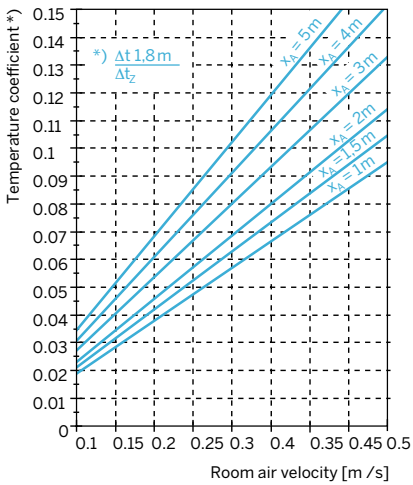
ROOM AIR VELOCITY, OUTLET DISTANCE

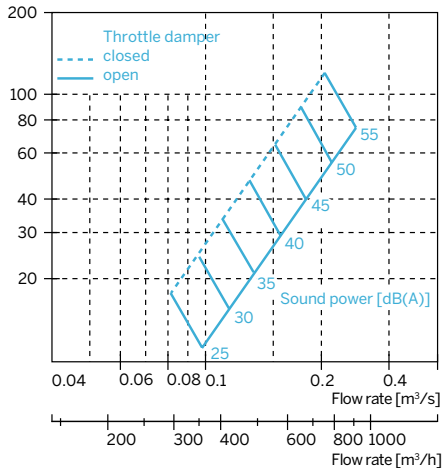


DRA 2 ☐ 600, ø 600, ☐ 625, measurement under isothermal conditions with multi-row square outlet arrangement

TEMPERATURE COEFFICIENT



SOUND POWER, PRESSURE DROP



Swirl diffuser DRA 2, round and square

EXAMPLE

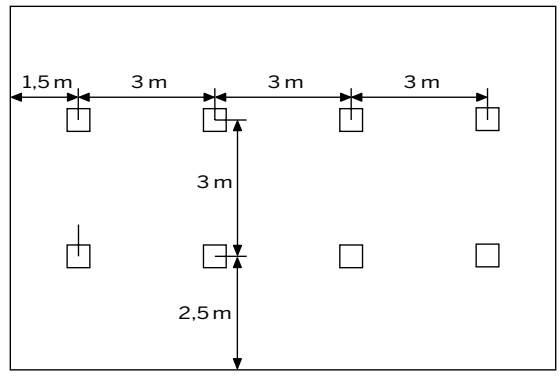
The following cafeteria is to be ventilated:

Conditions

Room length	L = 12.0 m
Room width	B = 8.0 m
Room height	H = 3.6 m
Ceiling grid	625 x 625 mm
Air exchange rate	n = 8 h^{-1}
Room temperature	t_R = 22 °C
Supply air temperature	t_Z = 16 °C
Max. velocity in the common area	WR = 0.2 m/s

Results

Room volume	$\dot{V}_R$ = 345 m^3
Total flow rate	$\dot{V}_{tot}$ = 2,760 m^3/h
Amount and size of outlets	8 pieces, 400 mm
Flow rate per outlet	$\dot{V}$ = 345 m^3/h
Sound pressure level — from diagram	3 L_W = 39 dB(A)
Pressure drop – from diagram	3Δp = 38 Pa
Space between outlets – according to diagram 1	x_A = 2.3 m
– selected	x_A = 3.0 m
Temperature coefficient – from diagram 2	Δ t/Δ t_Z = 0.068

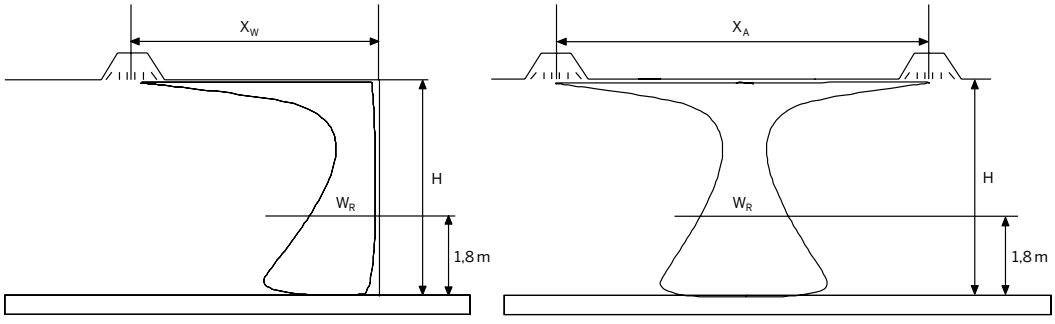


Calculated

Actual temperature in the common area

$$t_A = (\Delta t/\Delta t_Z) \times (t_Z - t_R) + t_R$$
$$= 0.068 \times (16\,°C - 22\,°C) + 22\,°C = 21.6\,°C$$

CEILING JET



Key

X_A – distance between two outlets (m)
X_W – distance to the wall (m), $X_W = X_{A/2}$
W_R – common area as per DIN EN 13779
Δt_Z – supply air temperature difference
Δt_L – temperature difference between room air and entering jet of air at distance $x = x_{A/2} + H_1$

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TYPE CODES

DRA2 – Q – 625 – AK – RAL 9010

Colour
standard RAL 9010

Accessories

AK	–	plenum box with perforated plate (supply air)
AKdk	–	plenum box with throttle damper (supply air)
AKdkiso	–	plenum box with throttle damper (supply air) and insulation
AKiso	–	plenum box with perforated plate (supply air) and insulation
AKA	–	plenum box (extract air)
AKAdk	–	plenum box (extract air) with throttle damper

Delivery sizes – 325, 400, 500, 600, 625, 625/400

Design

Q	–	square
R	–	round

Types of air diffuser
Swirl diffuser with fixed blades

EXAMPLE ORDER

Square ceiling air diffuser
DRA 2 (standard RAL 9010)

Size 625 (construction size)

Galvanised steel plenum box
with throttle damper for supply air

Order code

DRA2-Q-625-AKdk

Swirl diffusers
DRA 3

Swirl diffuser DRA 3, round and square

PRODUCT DESCRIPTION

The DRA 3 is a high induction swirl diffuser with adjustable air deflection blades, aerodynamically shaped. By changing the position of the blades, different ceiling jet shapes can be achieved: Thus, by tilting all blades (air jet pattern A) a high induction ceiling jet is achieved (Coandă effect). A ceiling jet with a slight horizontal component can be generated by tilting the blades and setting them to a proportionally horizontal position (air jet pattern B). The jet shape can be easily adjusted even if the room geometry changes at a later date.

The DRA 3 is designed for room and ceiling heights of 2.5 m to 4.0 m and a supply air temperature difference of up to 12 Kelvin.

The square version of the DRA 3 is intended for installation in a suspended ceiling grid and is supplied with a reinforcing ring in the back. The air deflection blades and clamps are available in both black and white. The swirl diffuser is supplied with a central counter punched hole and matching screw together with cover cap. The plenum box has been acoustically and aerodynamically matched to the swirl diffuser DRA 3 in laboratory tests.

The standard design (front plate only) is coated in RAL colour 9010; other colours are also available as special designs.

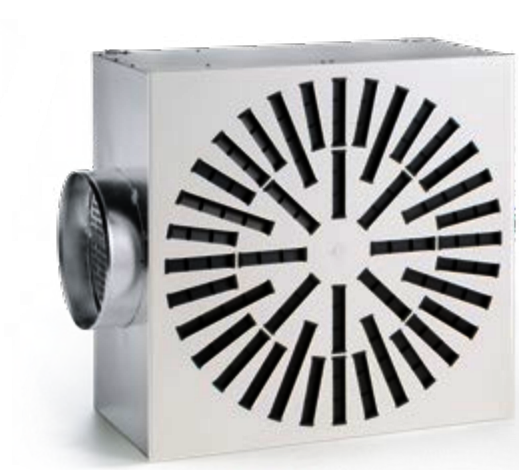
We reserve the right to make technical modifications.

SPECIAL VERSIONS

RAL colour of your choice (front plate)

RECOMMENDED RANGE

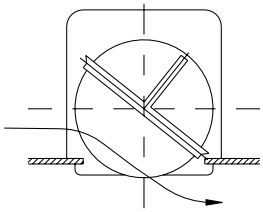
Sizes	$\dot{V}_{min}$		$\dot{V}_{max}$	
	l/s	m³/h	l/s	m³/h
310	41	150	105	380
400	47	170	140	500
625/400	47	170	140	500
500	83	300	250	900
600	111	400	305	1100
625	111	400	305	1100
825	166	600	416	1500



DRA 3 (adjustable rollers)

Swirl diffuser DRA 3, round and square

AIR FLOW VARIANT A

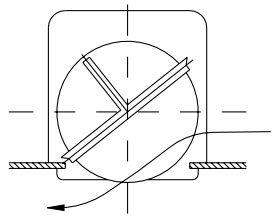


Blade position “s”

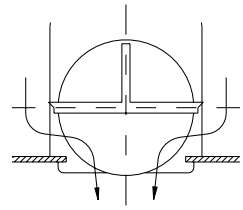
All air deflection blades are set in position “s” (angled).

AIR FLOW VARIANT B

1



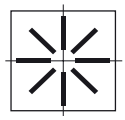
2



1 | Blade position “s”
2 | Blade position “h”

As per the illustrations, the air deflection blades are set in position “s” (angled) and position “h” (horizontal).

1



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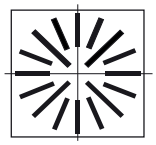

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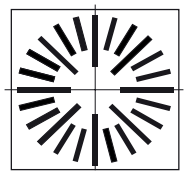

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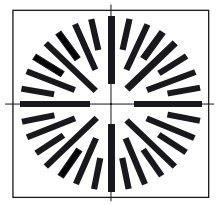

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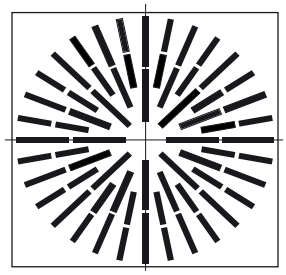
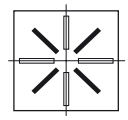


1 | ☐310
2 | ☐400
3 | ☐500
4 | ☐600/625
5 | ☐825

6



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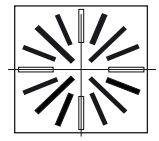

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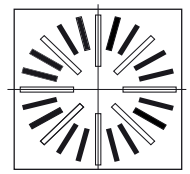

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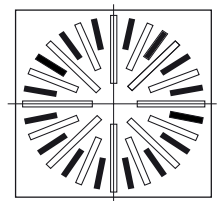

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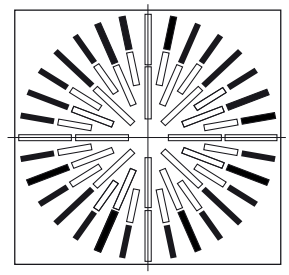
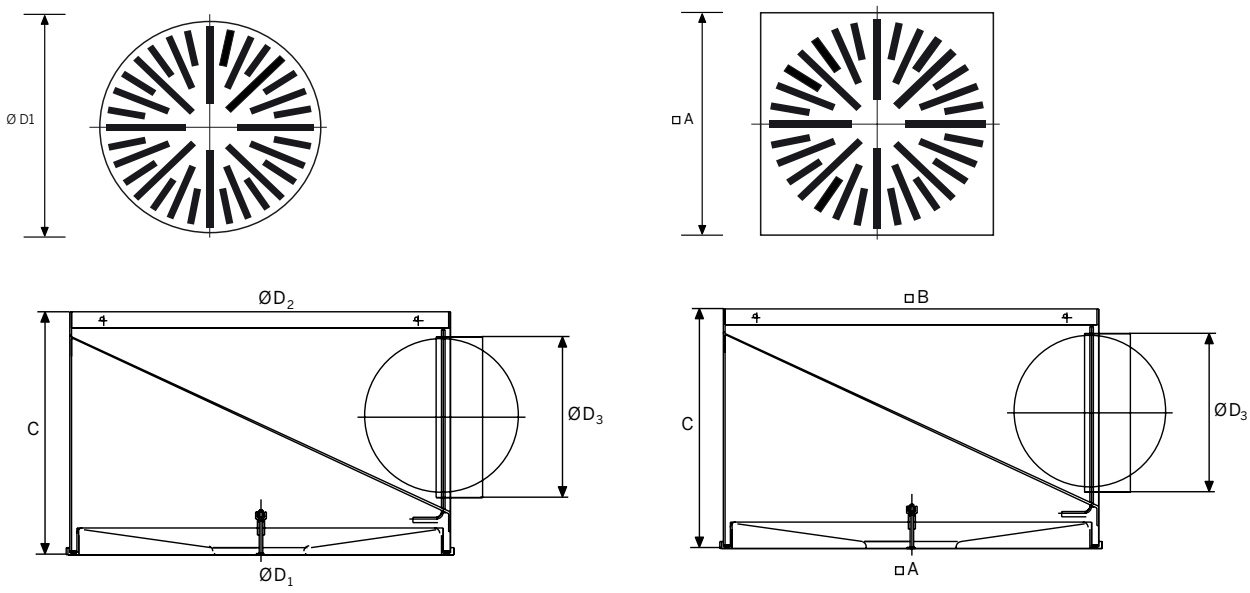


6 | ☐310
7 | ☐400
8 | ☐500
9 | ☐600/625
10 | ☐825

DIMENSIONS



DIMENSIONS, ROUND

Sizes	Ø D_1	Ø D_2	Ø D_3	C
310	310	307	158	210
400	400	397	198	250
500	500	497	198	250
600	600	597	248	300
825	825	822	353	400

DIMENSIONS, SQUARE

Sizes	A	W	C	Ø D_3
310	305	302	210	158
400	395	392	250	198
500	495	492	250	198
600	595	592	300	248
625	620	617	300	248
825	820	817	400	353

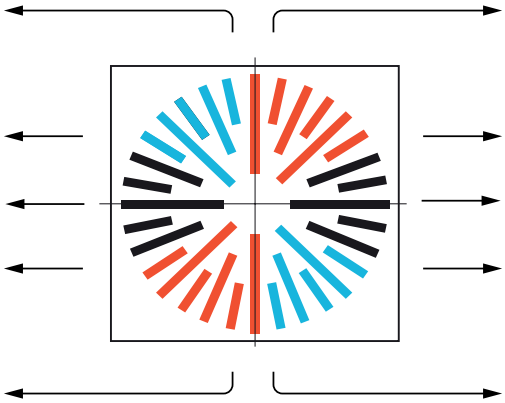
SOUND LEVEL REDUCTION ΔL_W DUE TO INSULATED PLENUM BOX*

ΔL_W (dB)							
63	125	250	500	1000	2000	4000	8000
1	3	3	11	15	15	15	15

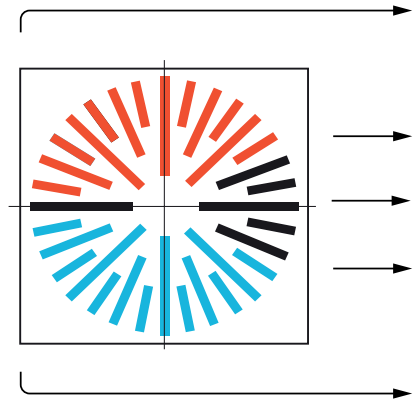
* Side walls and cover of plenum box with 20 mm mineral wool, glass fleece and perforated sheet metal shell

Swirl diffuser DRA 3, round and square

POSSIBILITIES OF DIFFERENT JET SHAPES



Double-sided air expulsion

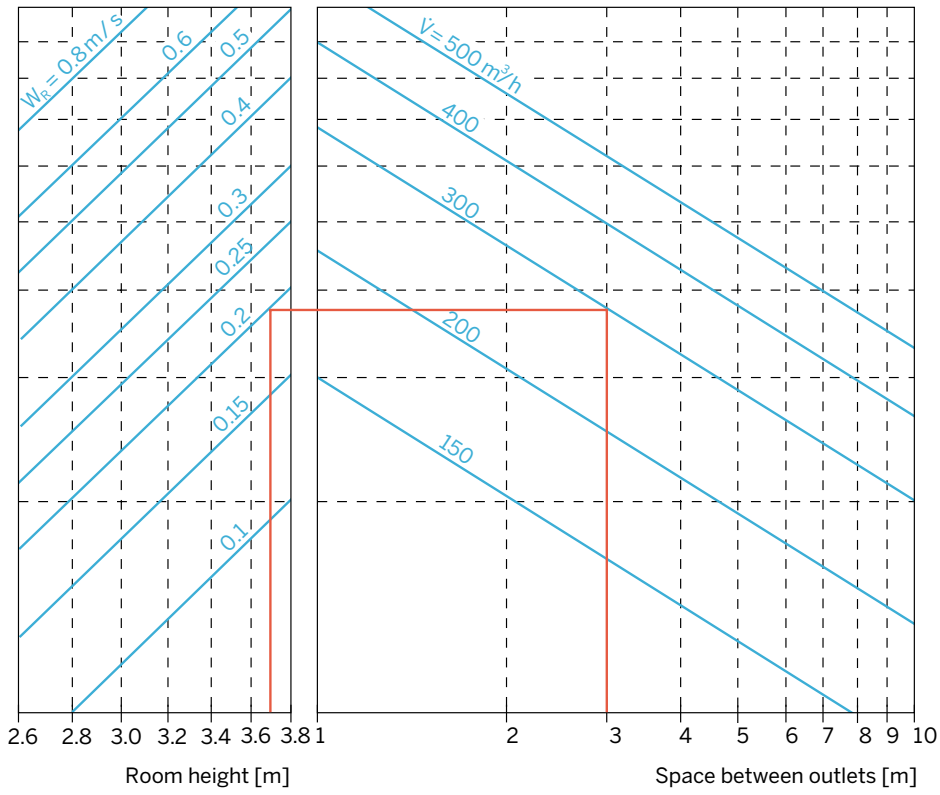


Single-sided air expulsion

- Blade position “s” (angled) clockwise
- Blade position “s” (angled) anticlockwise
- Blade slots covered (after removing the blades)

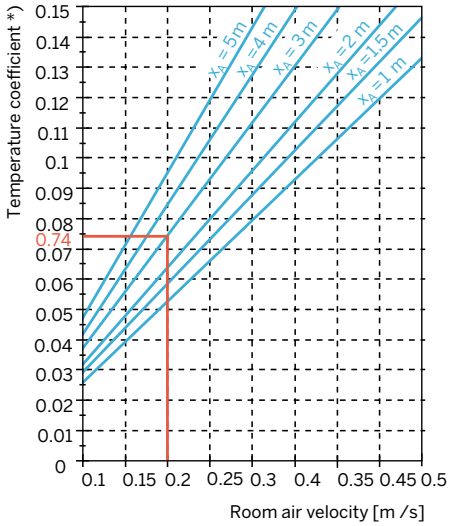
AIR FLOW VARIANT A

Room air velocity, space between outlets [diagram 1]

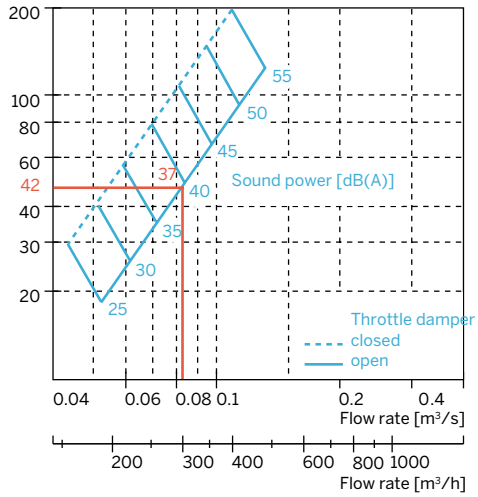


DRA 3 ☐400, Ø 400, measurement under isothermal conditions with multi-row square outlet arrangement

TEMPERATURE COEFFICIENT [DIAGRAM 2]



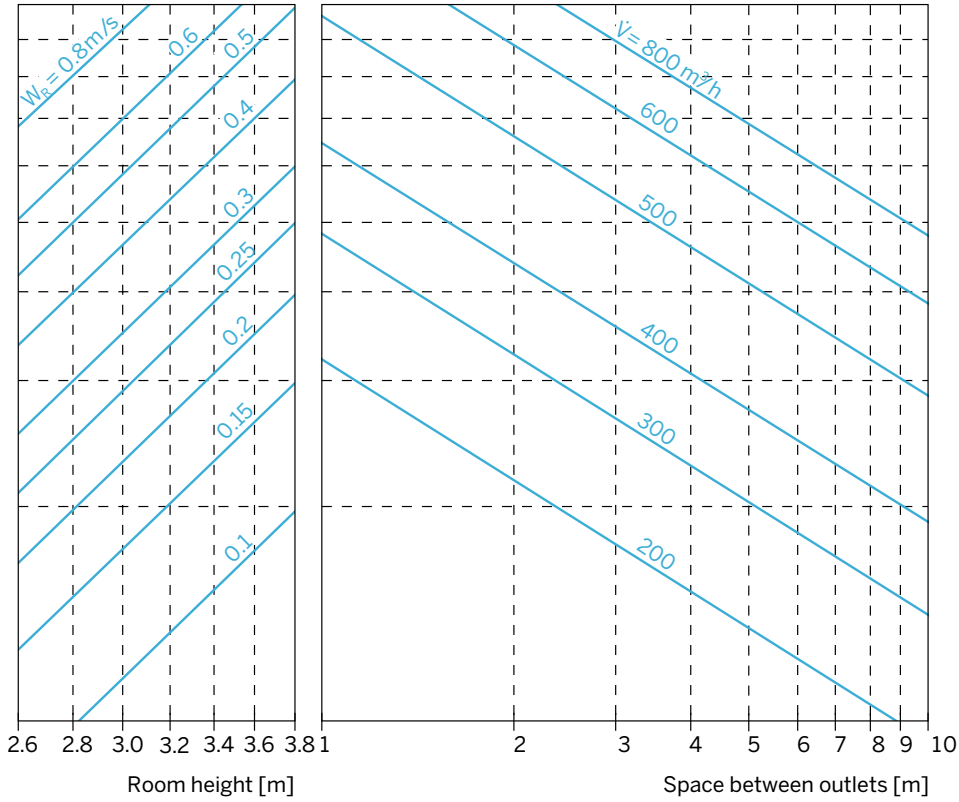
SOUND POWER LEVEL, PRESSURE DROP [DIAGRAM 3]



Swirl diffuser DRA 3, round and square

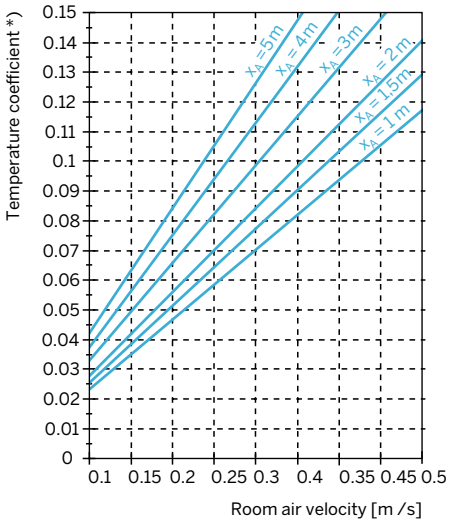
AIR FLOW VARIANT A

Room air velocity, space between outlets [diagram 1]

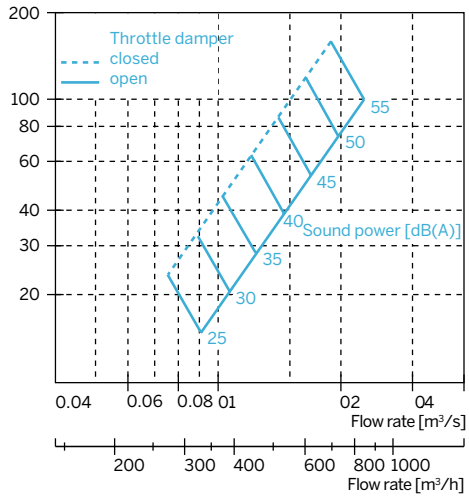


DRA 3 □500, Ø 500, measurement under isothermal conditions with multi-row square outlet arrangement

TEMPERATURE COEFFICIENT [DIAGRAM 2]



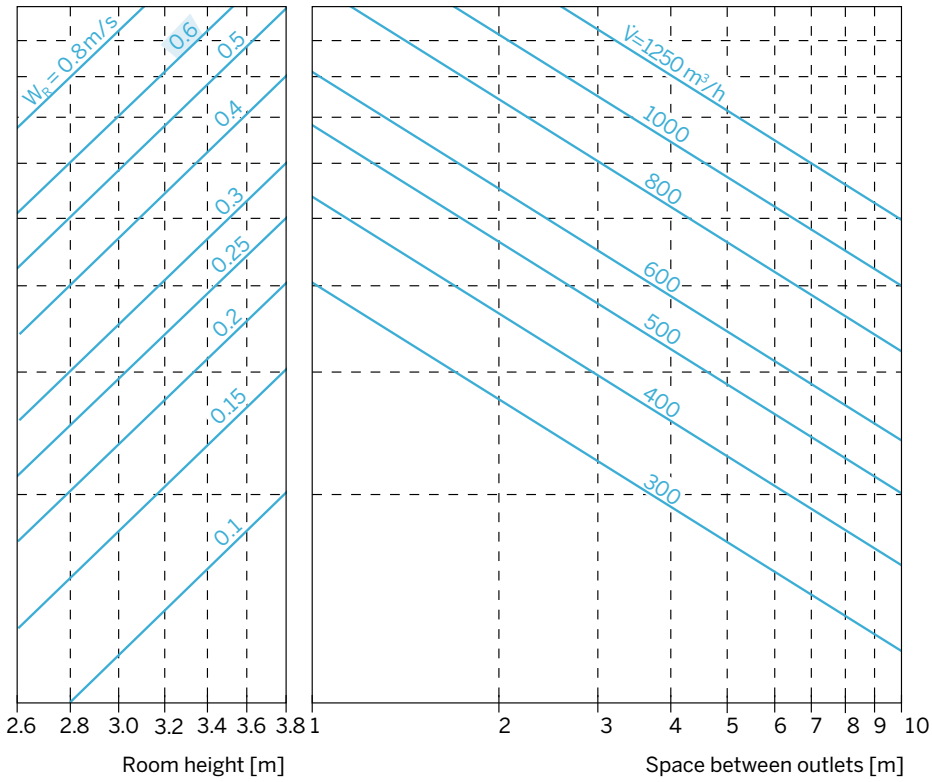
SOUND POWER LEVEL, PRESSURE DROP [DIAGRAM 3]



BerlinerLuft.

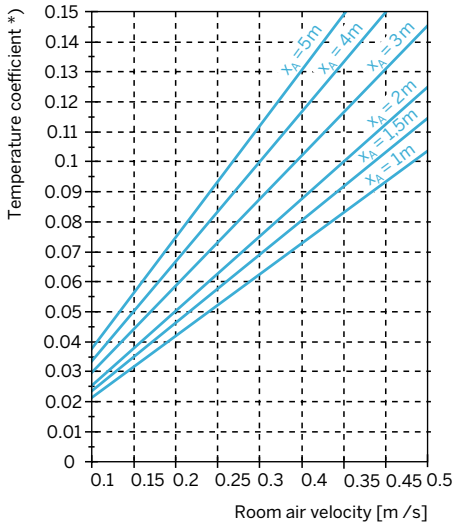
AIR FLOW VARIANT A

Room air velocity, space between outlets [diagram 1]

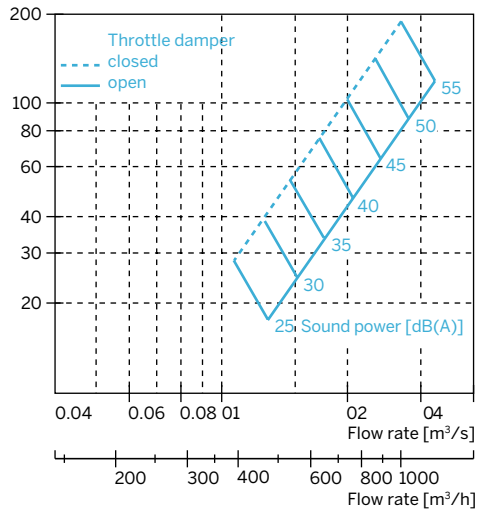


DRA 3 ☐600, Ø 600, ☐625, measurement under isothermal conditions with multi-row square outlet arrangement

TEMPERATURE COEFFICIENT [DIAGRAM 2]



SOUND POWER LEVEL, PRESSURE DROP [DIAGRAM 3]



Swirl diffuser DRA 3, round and square

EXAMPLE

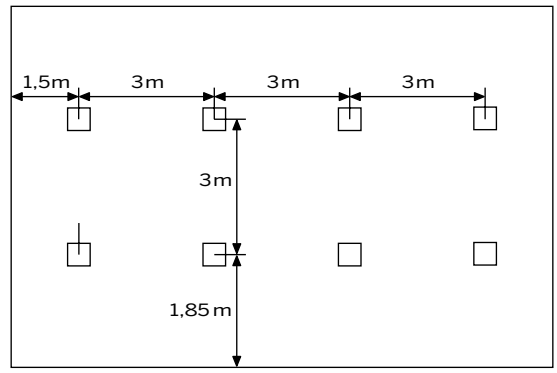
The following cafeteria is to be ventilated:

Conditions

Room length	L = 12.0 m
Room width	B = 6.75 m
Room height	H = 3.7 m
Ceiling grid	625 x 625 mm
Air exchange rate	$n = 8\ h^{-1}$
Room temperature	$t_R = 22\,°C$
Supply air temperature	$t_Z = 16\,°C$
Max. velocity in the common area	$W_R = 0.2\,m/s$

Found

Room volume	$\dot{V}_R = 300\,m^3$
Total flow rate	$\dot{V}_{tot} = 2{,}400\,m^3/h$
Amount and size of outlets	8 pieces 625/400 mm
Flow rate per outlet	$\dot{V} = 300\,m^3/h$
Sound pressure level – from diagram 3	$L_W = 39$ dB(A)
Pressure drop — from diagram 3	fj p = 48 Pa
Space between outlets – as per diagram 1	$x_A = 3.0$ m
– selected	$x_A = 3.0$ m
Temperature coefficient – from diagram 2	$\Delta t/\Delta t_Z = 0.074$

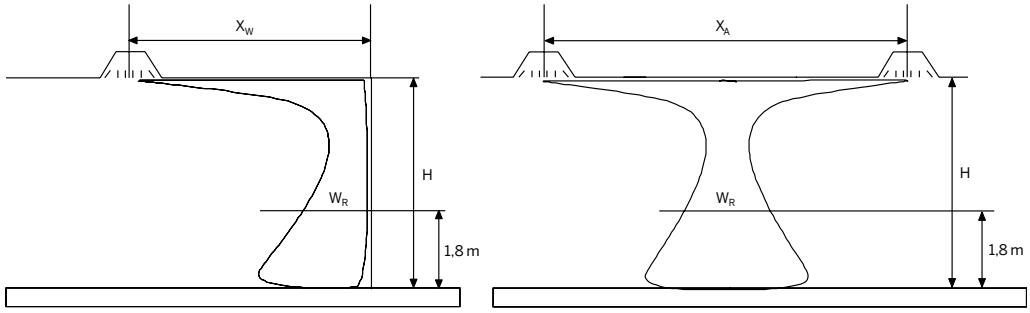


Calculated

Actual temperature in the common area

$$t_A = (\Delta t/\Delta t_Z) \times (t_Z - t_R) + t_R$$
$$= 0.074 \times (16\,°C - 22\,°C) + 22\,°C = 21.6\,°C$$

CEILING JET

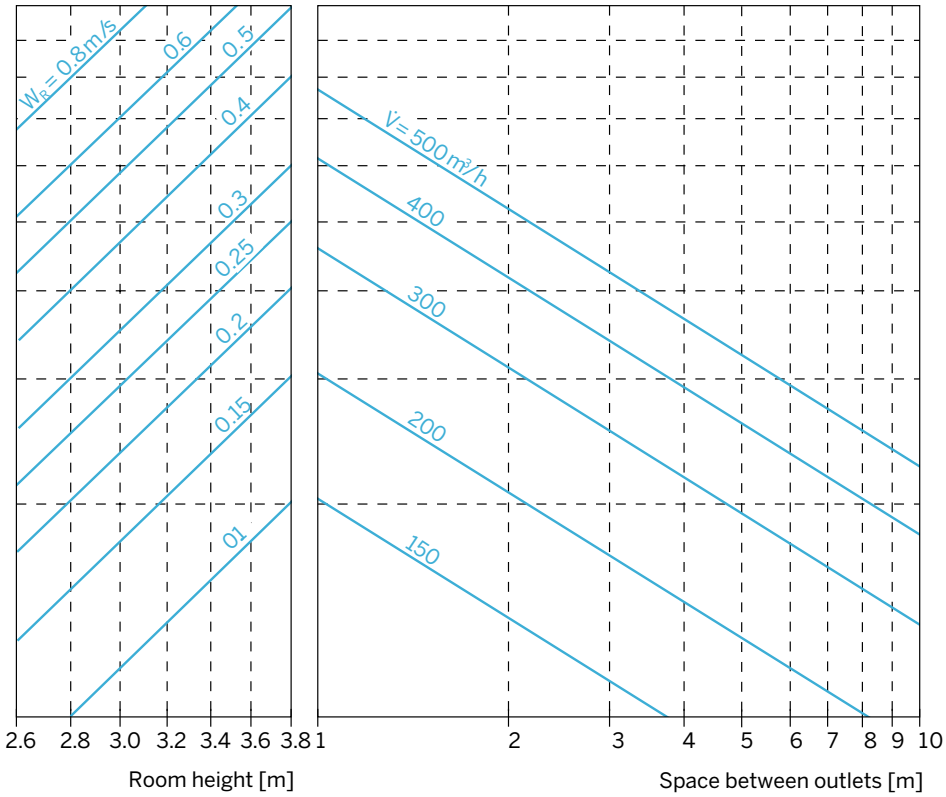


Key

X_A – distance between two outlets (m)
X_W – distance to the wall (m), $X_W = X_A/2$
W_R – common area as per DIN EN 13779
Δt_Z – supply air temperature difference
Δt_L – temperature difference between room air and entering jet of air at distance $x = x_{A/2} + H_1$

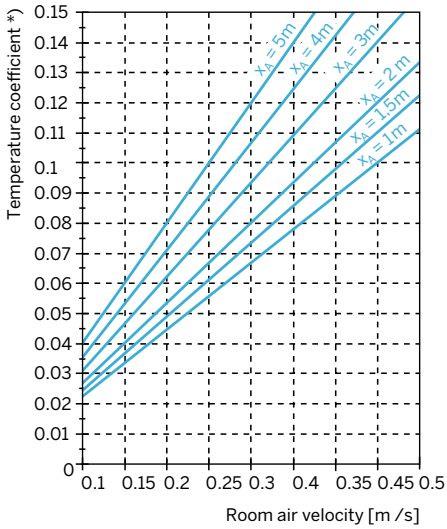
AIR FLOW VARIANT B

Room air velocity, space between outlets [diagram 1]

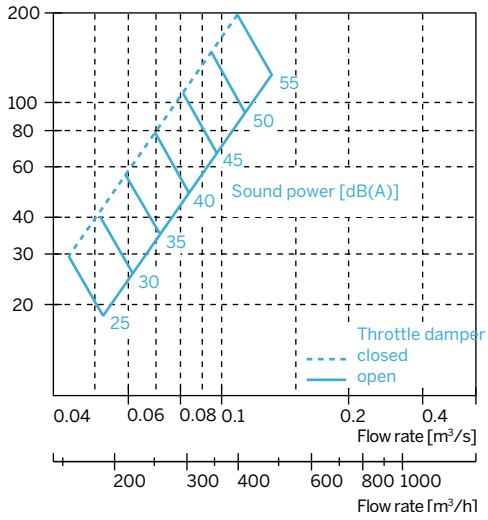


DRA 3 ☐400, Ø 400, measurement under isothermal conditions with multi-row square outlet arrangement

TEMPERATURE COEFFICIENT [DIAGRAM 2]



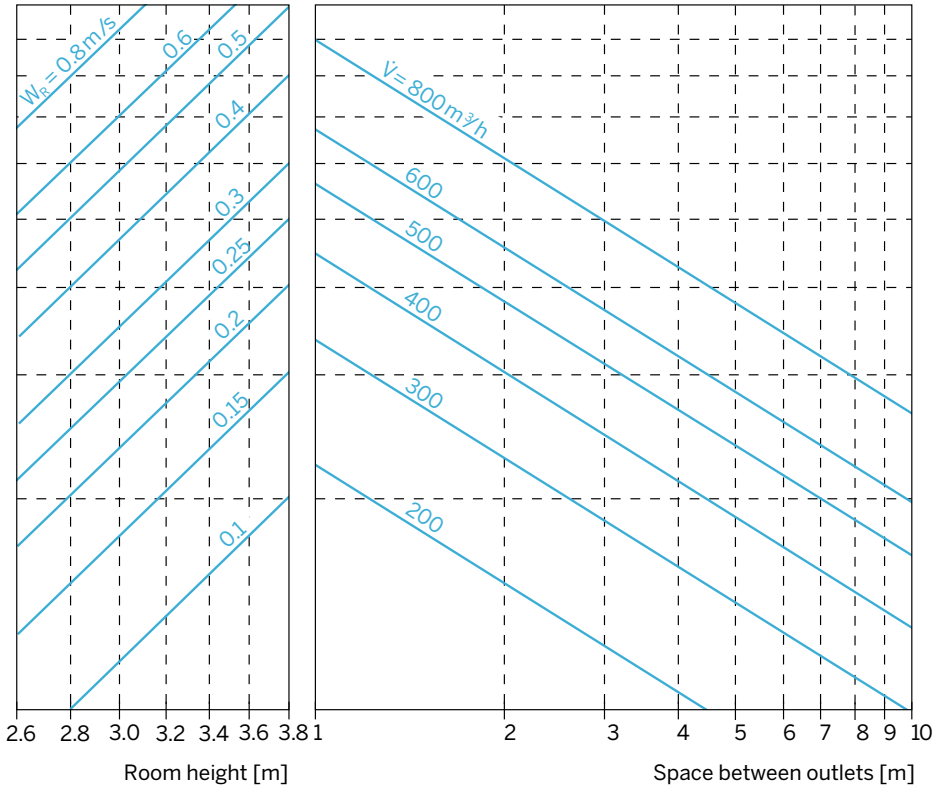
SOUND POWER LEVEL, PRESSURE DROP [DIAGRAM 3]



Swirl diffuser DRA 3, round and square

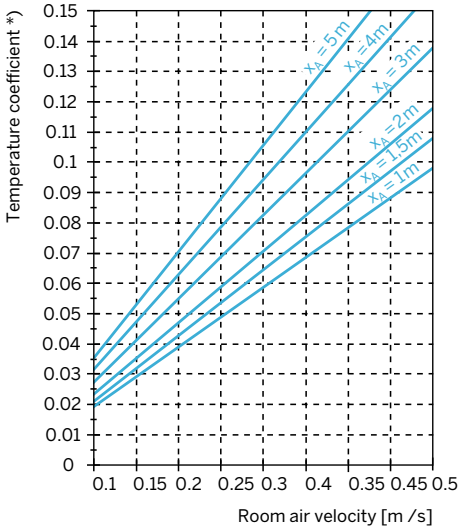
AIR FLOW VARIANT B

Room air velocity, space between outlets [diagram 1]

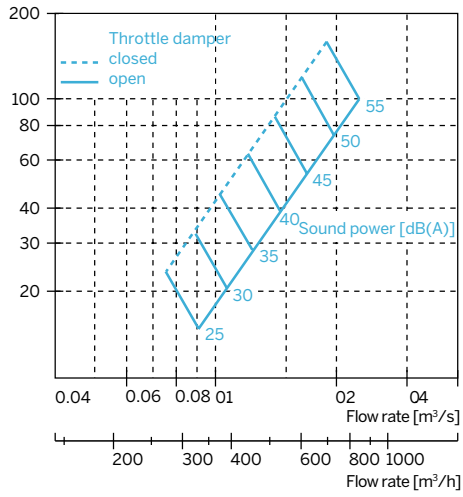


DRA 3 ☐500, Ø 500, measurement under isothermal conditions with multi-row square outlet arrangement

TEMPERATURE COEFFICIENT [DIAGRAM 2]



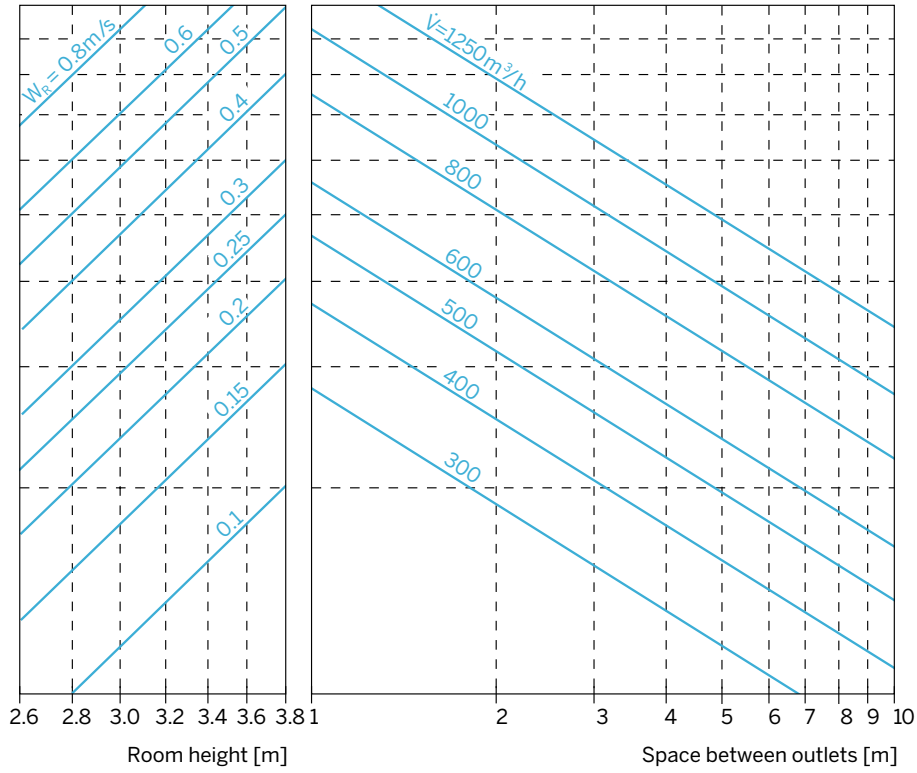
SOUND POWER LEVEL, PRESSURE DROP [DIAGRAM 3]



BerlinerLuft.

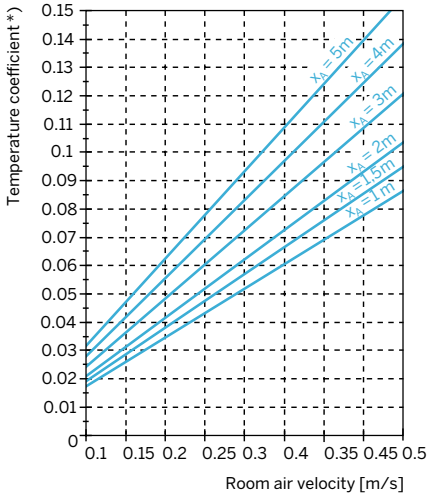
AIR FLOW VARIANT B

Room air velocity, space between outlets [diagram 1]

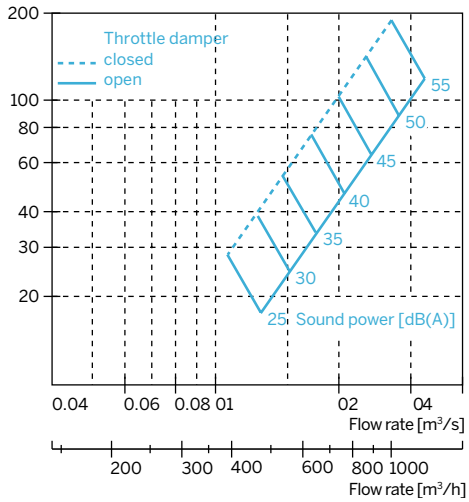


DRA 3 ☐600, Ø 600, ☐625, measurement under isothermal conditions with multi-row square outlet arrangement

TEMPERATURE COEFFICIENT [DIAGRAM 2]



SOUND POWER LEVEL, PRESSURE DROP [DIAGRAM 3]



Swirl diffuser DRA 3, round and square

TENDER SPECIFICATION TEXT

High induction square swirl outlet for supply air, suitable for ceiling mounting with adjustable air deflection blades in RAL 9005.

The blades are arranged in a circular pattern. Front plate made of sheet steel, powder-coated in RAL 9010, with central screw fixing and covering cap.

Make: **BerlinerLuft.**

Type: **DRA 3 – Q/S**
(size □ 310, 400, 500, 600, 625, 825)

Square swirl outlet for supply air, air deflection blades in RAL 9010
BerlinerLuft.
DRA 3 – Q/W (size □ 310, 400, 500, 600, 625, 825)

Circular swirl outlet for supply air, air deflection blades in RAL 9005
BerlinerLuft.
DRA 3 – R/S (size Ø 400, 500, 600)

Circular swirl outlet for supply air, air deflection blades in RAL 9010
BerlinerLuft.
DRA 3 – R/W (size Ø 400, 500, 600)

Square swirl outlet for extract air, without air deflection blades
BerlinerLuft.
DRA 3 – Q- (size □ 310, 400, 500, 600, 625, 825)

ACCESSORIES

Plenum box with integrated, perforated equalisation face plate (AK) for supply air

Plenum box with integrated, perforated equalisation face plate and throttle damper (AKdk) adjustable from below for supply air

Plenum box with integrated, perforated equalisation face plate and insulation (AKiso) for supply air

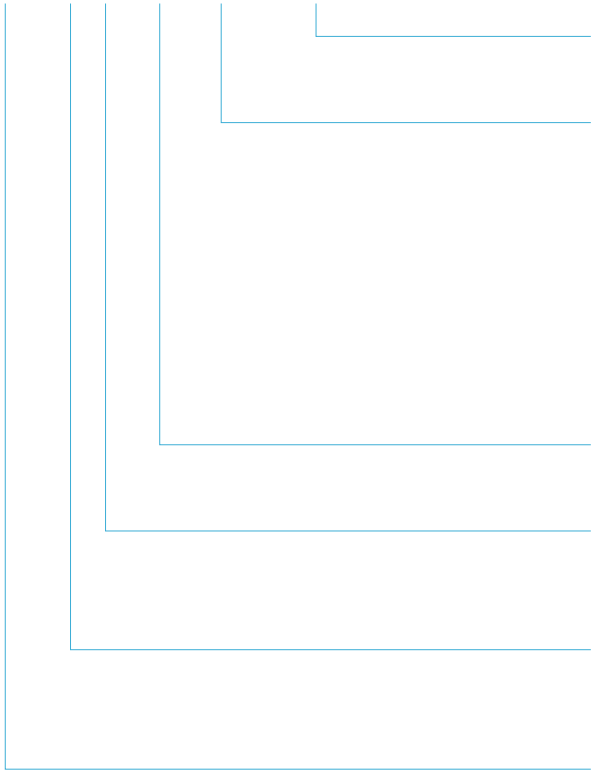
Plenum box with integrated, perforated equalisation face plate, insulation and throttle damper (AKdkiso) adjustable from below for supply air

Plenum box (AKA) for extract air

Plenum box with throttle damper (AKAdk) for extract air

TYPE CODES

DRA 3 – Q/W – 600 – AK – RAL xxxx



Colour
RAL xxxx (standard RAL 9010)

Accessories

AK	–	plenum box (supply air)
AKdk	–	plenum box with throttle damper and perforated face plate (supply air)
AKdkiso	–	plenum box with throttle damper and perforated face plate(supply air) and insulation
AKiso	–	plenum box (supply air) and insulation
AKA	–	plenum box (extract air)
AKAdk	–	plenum box (extract air) with throttle damper

Delivery sizes
310, 400, 500, 600, 625, 825

Blade colour

S	–	black set of blades
W	–	white set of blades

Design

Q	–	square
R	–	round

Type of swirl diffuser
swirl diffuser with adjustable blades

EXAMPLE ORDER

Square ceiling air diffuser with black blades, size 600

Plenum box with damper and perforated face plate for supply air

Order code

DRA3-Q/S-Gr. 600-AKdk

Swirl diffusers
DRA 4

Swirl diffuser DRA 4, round and square

PRODUCT DESCRIPTION

The DRA 4 is a high induction swirl diffuser with adjustable and aerodynamically shaped air deflection blades in a radial arrangement. By changing the position of the blades, different ceiling jet shapes can be achieved: Thus, by tilting all blades (air jet pattern A), a high induction ceiling jet is achieved (Coandă effect). By tilting the blades and setting them to a proportionally horizontal position (air jet pattern B), a ceiling jet with a slight horizontal flow can be generated. The jet shape can be easily adjusted even if the room geometry changes at a later date.

The DRA 4 is designed for room and ceiling heights from 2.5 to 4.0 m and a supply air temperature difference of up to 12 Kelvin.

The square version of the DRA 4 is intended for installation in a suspended ceiling grid and is supplied with a reinforcing ring in the back. The air deflection blades and clamps are available in both black and white. The swirl diffuser is supplied with a central counter punched hole and matching screw and cap. The plenum box has been acoustically and aerodynamically matched to the swirl outlet DRA 4 in laboratory tests. The standard version (front plate only) of the DRA 4 is coated in RAL colour 9010. Other colours are available as special versions.

We reserve the right to make technical modifications.

SPECIAL VERSIONS

RAL colour of your choice

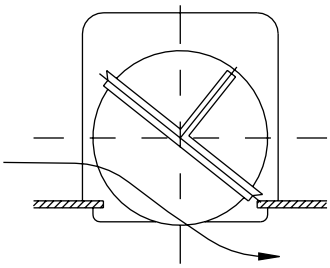
RECOMMENDED RANGE

Sizes	Blades Amount	$\dot{V}_{min}$		$\dot{V}_{max}$	
		l/s	m³/h	l/s	m³/h
300	8	15	55	44	160
400 **500** **600** **625**	16	27	100	100	360
500	24	38	140	119	430
600 **625**		55	200	188	680
600 **625**	48	100	360	244	880
825	72	155	560	333	1200

DRA 4

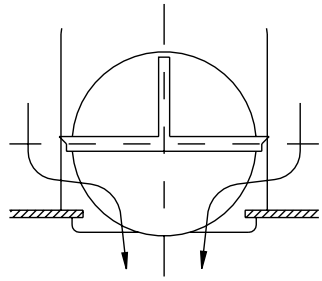
Swirl diffuser DRA 4, round and square

AIR FLOW VARIANT A

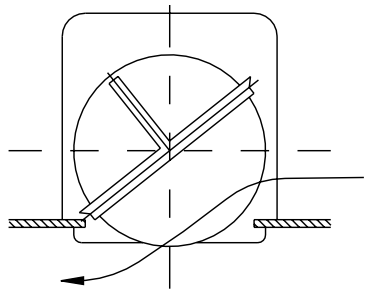


Blade position “s”

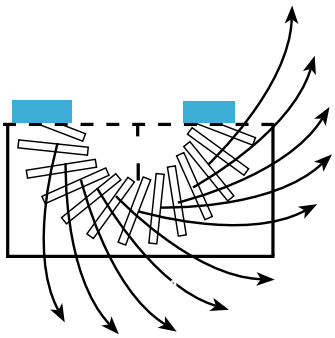
AIR FLOW VARIANT B

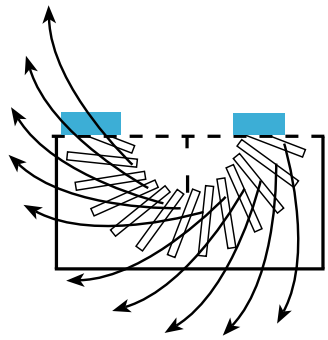


Blade position “h”

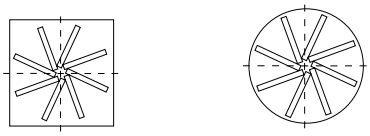


Blade position “s”





OVERVIEW OF FRONT PLATES

1


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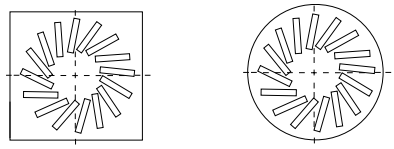

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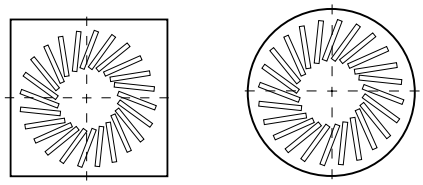

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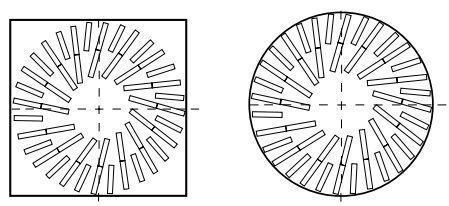

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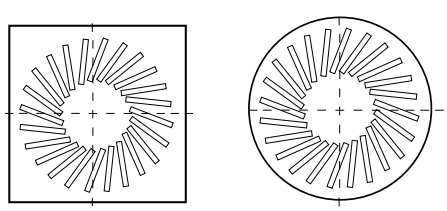

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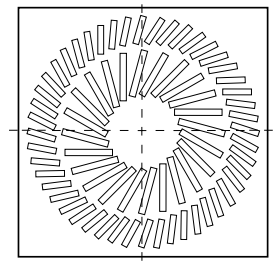

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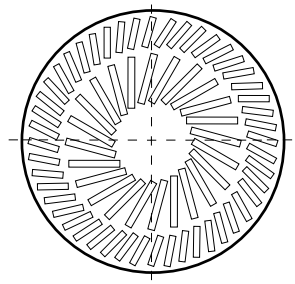
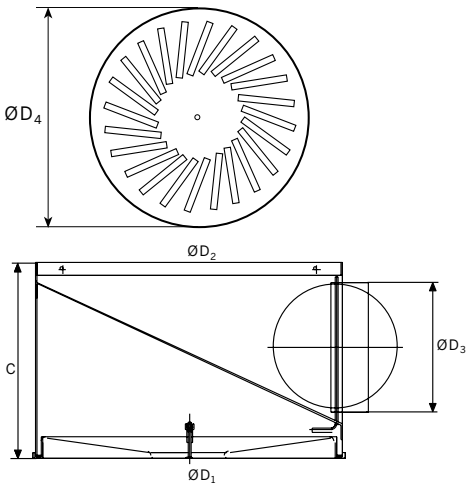
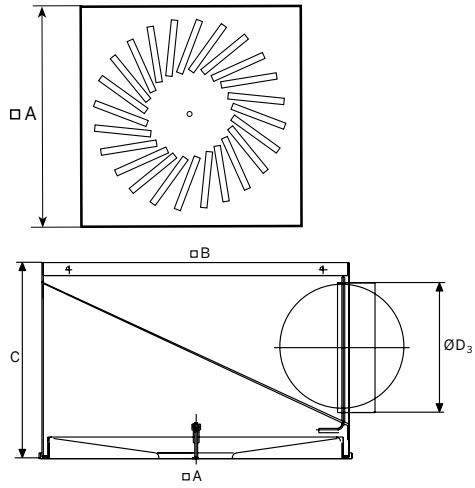


1 | ☐ / ø 300 – 8 blades
2 | ☐ / ø 400, 500, 600, 625 – 16 blades
3 | ☐ / ø 500 – 24 blades
4 | ☐ / ø 600, 625 – 48 blades
5 | ☐ / ø 600, 625 – 24 blades
6 | ☐ 825 – 72 blades
7 | ø 825 – 72 blades

Swirl diffuser DRA 4, round and square

DIMENSIONS





DIMENSIONS, ROUND

Sizes	Ø D_1	Ø D_2	Ø D_3	C
300	300	297	158	210
400	400	397	198	250
500	500	497	198	250
600	600	597	248	300
625	625	622	248	300
825	825	822	353	400

DIMENSIONS, SQUARE

Sizes	A	W	Ø D_3	C
300	295	292	158	210
400	395	392	198	250
500	495	492	198	250
600	595	592	248	300
625	620	617	248	300
825	820	817	353	400

SOUND LEVEL REDUCTION ΔL_W DUE TO INSULATED PLENUM BOX

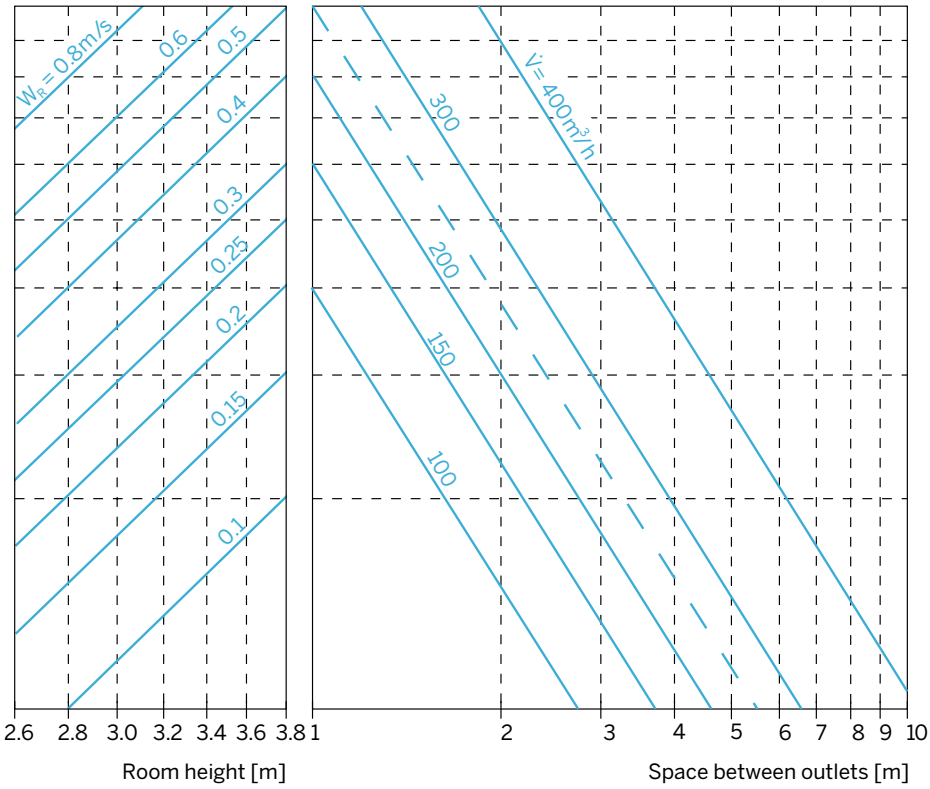
ΔL_W (dB)								
63	125	250	500	1000	2000	4000	8000	
1	3	3	11	15	15	15	15	

TECHNICAL PARAMETERS

Sizes	300	400, 500, 600, 625	500	600, 625	600, 625	825
Blades	**8**	**16**	**24**	**24**	**48**	**72**
$\dot{V}_{max}$ $\dot{V}_{min}$	160 55	360 100	430 140	680 200	880 360	1200 560
L_{WA} L_{WA}	40 20	40 20	40	40 20	40 20	40 20
Sef	0.0070	0.0140	0.0210	0.0295	0.0420	0.0715

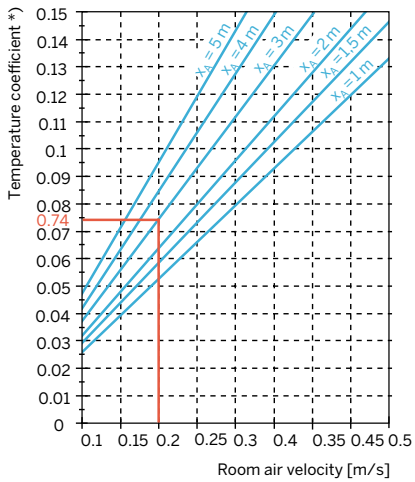
AIR FLOW VARIANT A

Room air velocity, space between outlets [diagram 1]

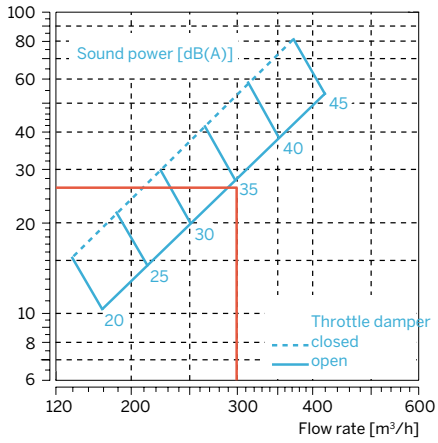


DRA 4 Ø 400, 500, 600, 625, 16 blades, measurement under isothermal conditions with multi-row square outlet arrangement

TEMPERATURE COEFFICIENT [DIAGRAM 2]



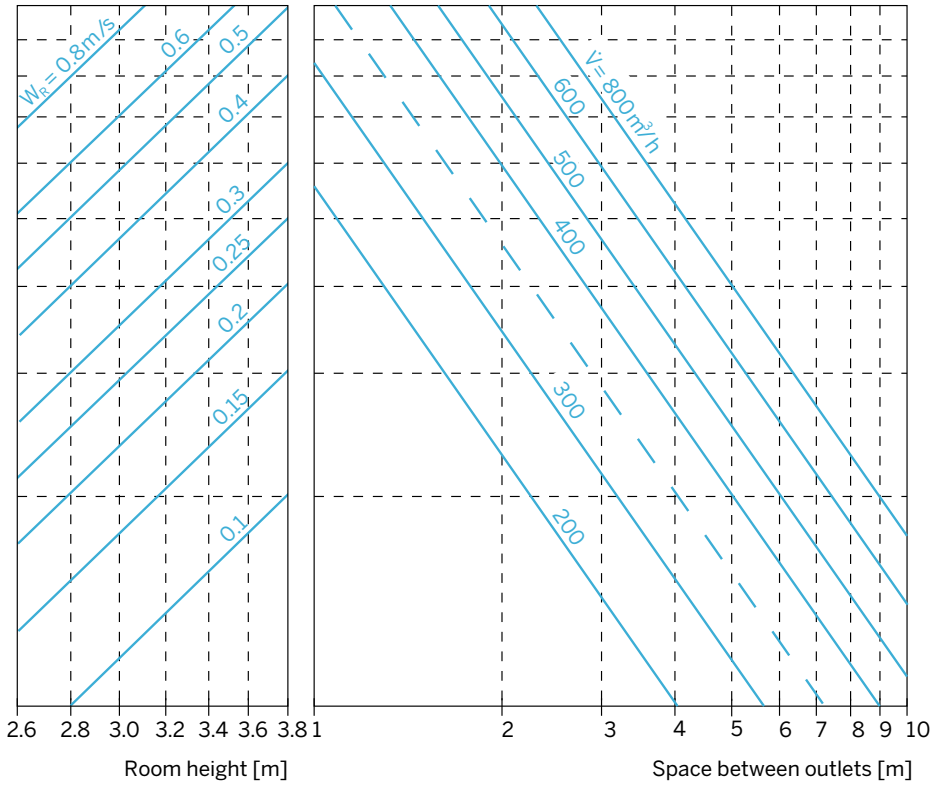
SOUND POWER LEVEL, PRESSURE DROP [DIAGRAM 3]



Swirl diffuser DRA 4, round and square

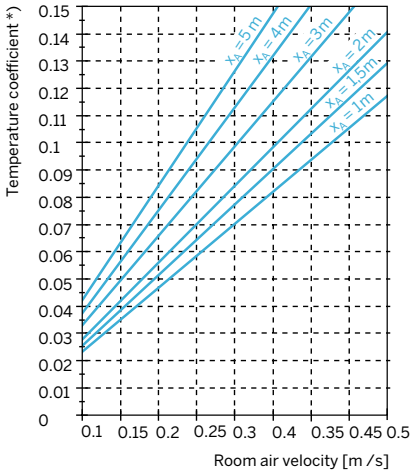
AIR FLOW VARIANT A

Room air velocity, space between outlets [diagram 1]

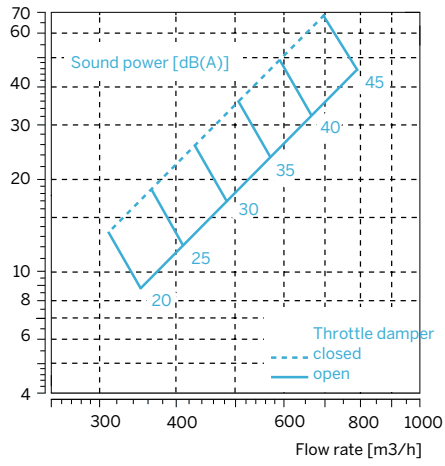


DRA 4 Ø 500, ☐ 600, 625, 24 blades, measurement under isothermal conditions with multi-row square outlet arrangement

TEMPERATURE COEFFICIENT [DIAGRAM 2]

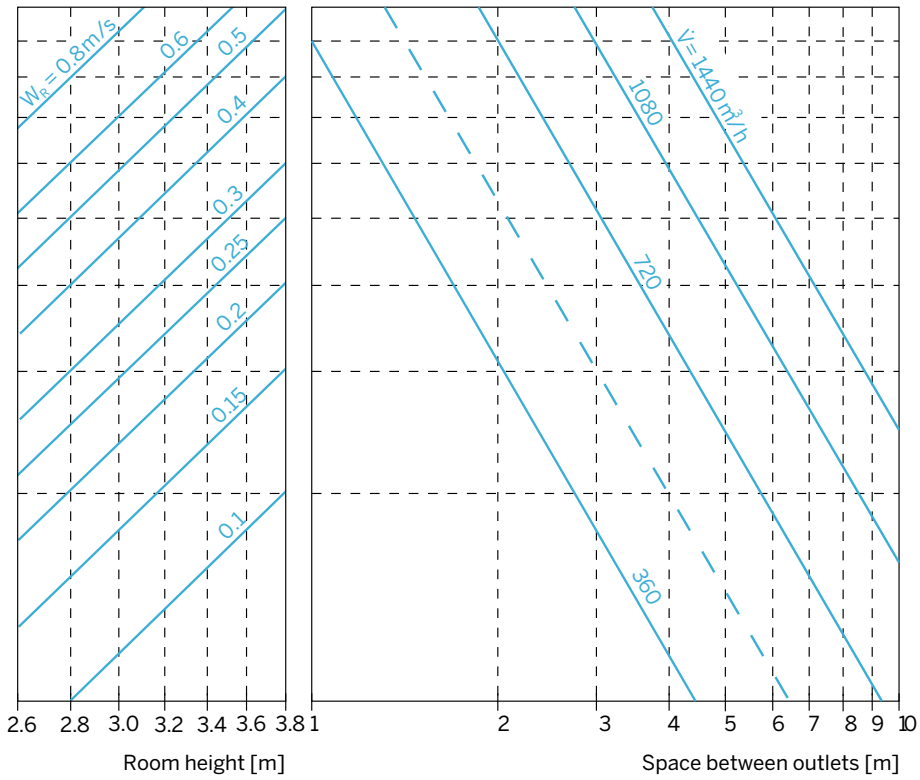


SOUND POWER LEVEL, PRESSURE DROP [DIAGRAM 3]



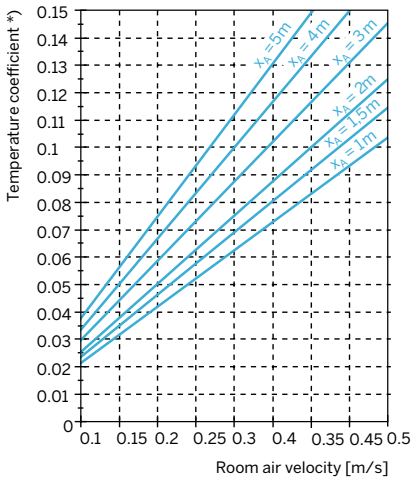
BerlinerLuft.

Room air velocity, space between outlets [diagram 1]

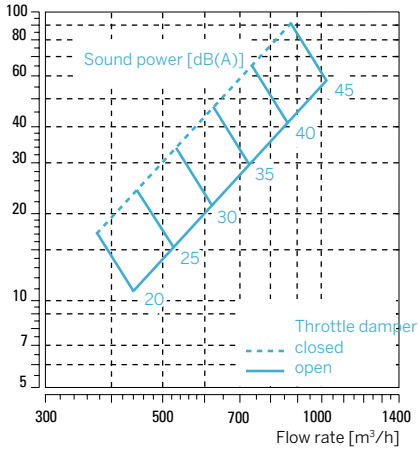


DRA 4 ☐600, Ø 600, ☐625, 48 blades, measurement under isothermal conditions with multi-row square outlet arrangement

TEMPERATURE COEFFICIENT [DIAGRAM 2]



SOUND POWER LEVEL, PRESSURE DROP [DIAGRAM 3]



Air flow variant A

EXAMPLE

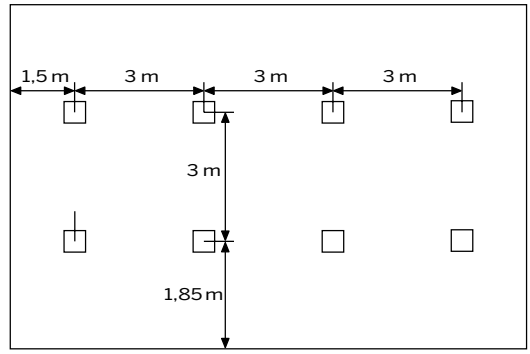
The following cafeteria is to be ventilated:

Conditions

Room length	L = 12.0 m
Room width	B = 6.75 m
Room height	H = 3.7 m
Ceiling grid	625/16
Air exchange rate	n = 8 h^{-1}
Room temperature	t_R = 22 °C
Supply air temperature	t_Z = 16 °C
Max. velocity in the common area	W_R = 0.2 m/s

Results

Room volume	$\dot{V}_R$ = 300 m^3
Total flow rate	$\dot{V}_{tot}$ = 2,400 m^3/h
Amount and size of outlets	8 pieces, 625/16
Flow rate per outlet	$\dot{V}$ = 300 m^3/h
Sound pressure level – from diagram 3	LW = 35 dB(A)
Pressure drop — from diagram 3	Δ p = 27 Pa
Space between outlets – as per diagram 1	x_A = 3.0 m
– selected	x_A = 3.0 m
Temperature coefficient – from diagram 2	$\Delta t/\Delta t_Z$ = 0.074

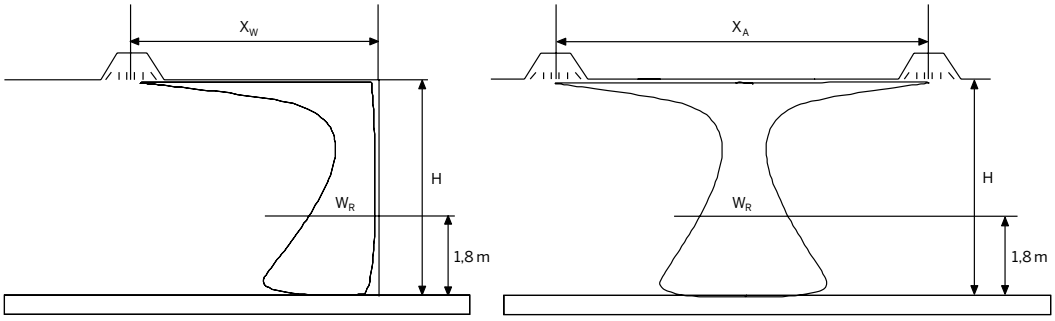


Calculated

Actual temperature in the common area

$$t_A = (\Delta t/\Delta t_Z) \times (t_Z - t_R) + t_R$$
$$= 6/0.074 \times (16\,°C - 22\,°C) + 22\,°C = 21.6\,°C$$

CEILING JET



Blade row set horizontally in relation to the wall

Key

X_A – distance between two outlets (m)
X_W – distance to the wall (m), $X_W = X_{A/2}$
W_R – common area as per DIN EN 13779
Δt_Z – supply air temperature difference
Δt_L – temperature difference between room air and entering jet of air at distance $x = x_{A/2} + H_1$

Swirl diffuser DRA4

TYPE CODES

DRA 4 – Q/S – 600-48 – AK – RAL xxxx

Colour
RAL xxxx (standard RAL 9010)

Accessories

AK	–	junction box with perforated face plate (supply air)
AKdk	–	junction box with throttle damper (supply air)
AKdkiso	–	junction box with throttle damper perforated face plate (supply air) and insulation
AKiso	–	junction box (supply air) and insulation
AKA	–	junction box (extract air)
AKAdk	–	junction box (extract air) with throttle damper

Number of blades
8/16/24/48/54/72

Delivery sizes
300, 400, 500, 600, 625, 825

Set of blades

S	–	black
W	–	white

Design

Q	–	square front plate
R	–	round front plate

Type of swirl diffuser
swirl diffuser with radially arranged, individually adjustable blades

EXAMPLE ORDER

Square ceiling air diffuser with black blades

Size 600, number of blades 48

Plenum box for supply air with throttle damper

Order code

DRA4-Q/S-Gr. 600-48-AKdk